



CERTIFICATES:

Gateway to Gainful Employment and College Degrees



Anthony P. Carnevale
Stephen J. Rose
Andrew. R. Hanson

GEOGETOWN UNIVERSITY



Center
on Education
and the Workforce

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We undertook this report to help advance the discussion and understanding of certificates and their value. We believe that certificates will continue to grow in our nation's higher education system in the coming years. Because of the controversy surrounding certificates and the institutions that award them, we believe that efforts to contribute to transparency about their effects are essential.

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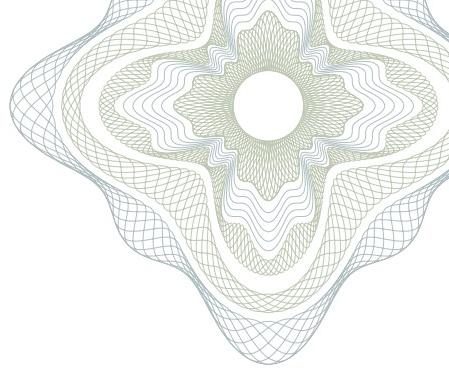
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INTRODUCTION



What are certificates?

Certificates are recognition of completion of a course of study based on a specific field, usually associated with a limited set of occupations.¹ Certificates differ from other kinds of labor market credentials such as industry-based certifications and licenses, which typically involve passing an examination to prove a specific competency, completing an apprenticeship or attending company or government training programs. Certificate programs take place in the classroom, mainly in public, two-year schools or private, for-profit, non-degree granting business, vocation, technical, and trade schools.

Certificates and other labor market credentials.

Certificates differ from other kinds of labor market credentials. Certificates are often confused with industry-based certifications, like a Microsoft or Cisco certification, for example. The essential difference between a certificate and an industry-based certification is that the certificates are earned through seat time in a classroom and industry-based certifications are awarded based on performance on a test, irrespective of where the learning occurs. Certificates more closely resemble degrees: They are awarded mainly by public, two-year schools or private, for-profit, non-degree granting business, vocational, technical, and trade schools. Certificates are typically classified by length of program: the amount of time a program is designed to be completed in, typically for students who are enrolled on a full-time basis. Short-term certificates take less than a year; medium-term certificates take between one and two years to complete; long-term certificates take between two and four years. Short-term certificates are most common, accounting for 54 percent in the most recently available data. Medium-term certificates account for 41 percent of certificates, while the remaining 5 percent are long-term certificates. There are baccalaureate and graduate certificates but they are not included in the definition of certificates used for this report; overall these certificates make up a very small fraction of certificates.

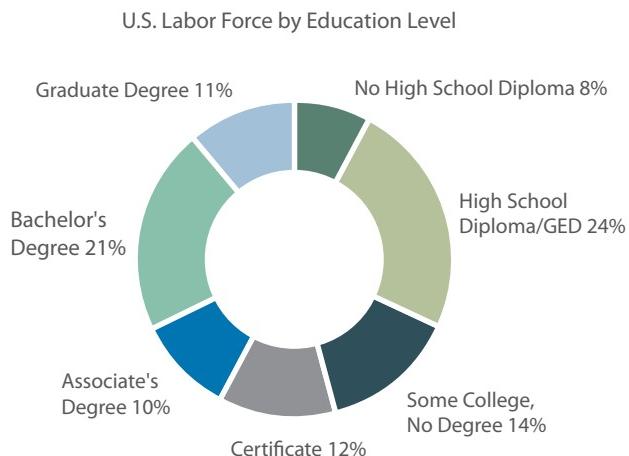
1. The two data sources that are used in this report are the Survey of Income and Program Participation (SIPP) and the National Longitudinal Survey of Youth (NLSY). The SIPP survey covers the entire population and the NLSY covers a young cohort that was between 13- and 17-years-old in 1997, which was followed until the cohort was between 25- and 29-years-old in 2009. Also the NLSY had more open-ended questions on certificates and hence may include some certificates that would not have been counted in the SIPP survey. Because the NLSY has a more inclusive definition of certificates, and partly because NLSY respondents are younger, the NLSY shows the larger number of people with certificates as their highest degree. Further, because NLSY stops at age 29, some people who currently have a certificate as their highest educational attainment may earn a college degree in the future, and therefore the certificate would no longer be their highest educational attainment.

Certificates are growing.

The number of certificates awarded has skyrocketed more than 800 percent over the past 30 years. In 1984, less than 2 percent of adults 18 and older had a certificate as their highest educational attainment; by 2009 the percentage had grown to almost 12 percent, according to the Survey of Income and Program Participation (SIPP).²

- 24 percent of all 23- to 65-year-old workers responded that they had attended a vocational, technical, trade, or business program beyond high school at some point.
- 75 percent of those who had attended these schools reported having earned a certificate.
- Overall, 18 percent of prime-age workers have obtained certificates and, of those, 12 percent have certificates as their highest educational attainment; and
- One third of certificate holders also have an Associate's, Bachelor's, or graduate degree.

Figure 1. Over 1 in 10 American workers reports a certificate as their highest level of education.



Source: Survey of Income and Program Participation (SIPP)

Summary of Findings

On average, certificate holders earn 20 percent more than high school graduates without any postsecondary education. However, the economic returns vary according to: the certificate's field of study, whether the certificate holder works in field, and the certificate holder's sex, race, and ethnicity. For example, 44 percent of certificate holders work in field. Certificate holders who work in field earn 37 percent more than those who work out of field. On average, a certificate holder who works in field earns nearly as much as the median Associate's degree holder—only 4 percent less. On the other hand, the median certificate holder who works out of field earns only 1 percent more than a high school-educated worker. There are two lessons here. First, certificate attainment is most successful when certificate holders are able to work in field. Second, the extent to which institutions can promote in-field work via, for example, job placement programs, will affect their graduates' success significantly in becoming gainfully employed.

2. For this report, the past two SIPP were combined (2005 and 2009) and earnings from 2005 were adjusted to 2009 dollars to have a large sample.

Certificate by Program Length.

Certificates With Value Vary In Length From A Few Months to Several Years

Most often, certificates are classified by the amount of instructional time required to complete a program of study:

- **Short-term certificates** require less than one year of instructional time.
- **Medium-term certificates** require one to two years of instructional time.
- **Long-term certificates** require two to four years of instructional time.

Among policymakers, practitioners, and other stakeholders, a growing consensus is emerging that certificates requiring less than one year of study have little economic value. This view is based on the intuition that more instruction leads to a variety and depth of general and occupational skills rewarded by the labor market and on the basis of independent studies usually conducted at the state level, such as Jepsen, Troske, and Coomes (2009), which analyzed certificate outcomes in Kentucky.

In Part 2 of this report, evidence is presented that suggests this assumption is overstated. In short, the appearance of low earnings returns from short-term certificates is largely because of the prevalence of healthcare certificates, which are highly concentrated among women and have relatively low earnings returns. After removing healthcare, the relationship between length of program and earnings largely evaporates. Sex and occupational-field variables seem to explain better the differences in earnings among certificate holders. While there are no data available on variation of earnings within fields based on program length, many of the fields predominantly consisting of short-term certificates (e.g., transportation and materials moving, police and protective services, and computer and information services) have average earnings.

A certificate holder's field (or program) of study can also influence earnings, especially if they work in an occupation related to their training.

- In computer and information services, men working in field earn \$72,498 per year, which is more than 72 percent of men with an Associate's degree and 54 percent of men with Bachelor's degrees. Women with certificates in this field and working in a related occupation earn \$56,664 annually, which is greater than 75 percent of women with an Associate's degree and 64 percent of women with a Bachelor's degree.
- In electronics, men earn \$64,700, more than 65 percent of the men with Associate's degrees and 48 percent of men with a Bachelor's degree.
- In business and office management, women earn \$38,204, which is more than 54 percent of women with Associate's degrees and 41 percent of women with Bachelor's degrees.

However, these high-earning cases depend on certificate holders working in their field of study: only 24 percent of men and 7 percent of women with certificates in information technology, for example, work in field. By contrast, 43 percent of men with an electronics certificate and 67 percent of women with a certificate in business and office management or in electronics work in field.

Sex also has a large influence on the fields of study students enter, as well as their earnings after earning certificates. Of the 14 different certificate fields identified, 12 are extremely sex segregated, meaning that three out of four certificate holders are of the same sex. Compared to men, women earn certificates that bring them limited earnings returns: a certificate's wage premium over a high school diploma is 27 percent for men and just 16 percent for women.³ By comparison, women with an Associate's degree earn 48 percent more than women with just a high school diploma, while the median male Associate's degree holder earns 43 percent more than his high school-educated counterpart. At the Bachelor's degree level, women earn 86 percent more than high school-educated women, while men earn 91 percent more than high school-educated men.

Men with certificates not only earn more than women with certificates, they also receive a larger wage premium from a certificate over a high school diploma. These differences show that certificates work well for men but give minimal labor market traction for women. Women seeking to use certificates for wage returns are typically better off pursuing at least a two-year degree. There are a few caveats, however. Women who work in field or enter high-earning certificate fields do well. And certificates may be a good option for women to gain credentials that allow them to adjust their hours or to go in and out of the labor force easily to accommodate their need to stay home because of family responsibilities.

Some certificate holders earn as much as or even more than workers with college degrees. Among male certificate holders, 39 percent earn more than the median male with an Associate's degree, and 24 percent earn more than the median male with a Bachelor's degree. Among female certificate holders, the numbers are comparable: 34 percent earn more than female Associate's degree holders, and 23 percent earn more than female Bachelor's degree holders.

Organization of the Report

The rest of this report is divided into three sections and a conclusion.

Part 1: Who Gets Certificates? discusses the population of certificate earners and their demographic characteristics. It also covers certificate earners who combine certificates with two- and four-year degrees and the various paths they take.

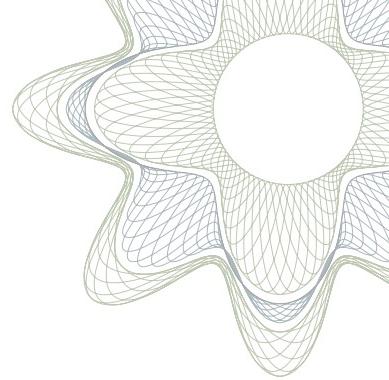
Part Two: Occupations and Earnings Returns for Certificate Holders looks in greater detail at the different outcomes for certificate holders in the labor market. Specifically, this section details how earnings vary by sex, race and ethnicity, and field of study, and whether certificate holders work in field.

Part Three: Where Are Certificate Programs and Workers? examines institutions, such as public two-year colleges and for-profit institutions, that are largely responsible for certificate awards and how certificate awards and workers are concentrated across states. The section also shows how costs vary across these institutions.

3. In this paper, those who earned their GED (high school equivalency) degree are included with those who earned their high school diploma.

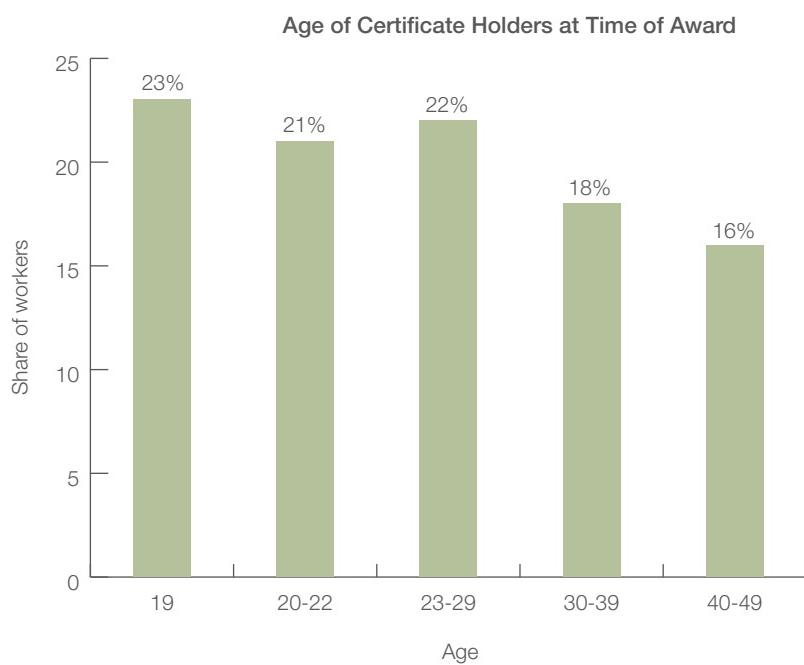
Part One:

WHO EARN CERTIFICATES?



Not only young people earn certificates. In fact, people earn their certificates throughout their working lives.

Figure 2. People earn certificates throughout their working lives. •



Source: Survey of Income and Program Participation (SIPP)

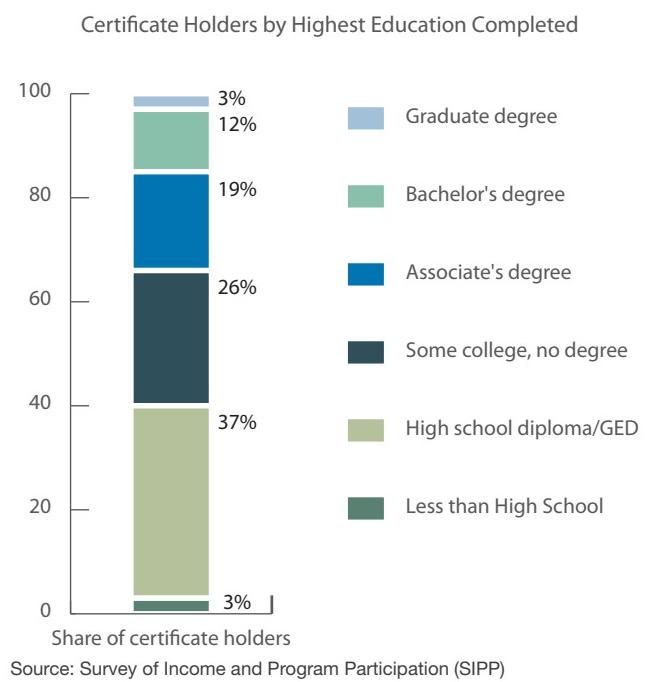
Among certificate holders, 23 percent earned their certificate immediately after high school. Twenty-one percent earned a certificate between ages 20 and 22, the ages when many people attend postsecondary education, and 22 percent earned certificates between ages 23 and 29, usually the early years of careers. A total of nearly two-thirds of certificate holders received certificate training in the years immediately after graduating from high school and during the early years of their careers. The remaining third appear to have obtained certificates to expand skills in their occupation or to retrain for another occupation. Among certificate holders, 18 percent received a certificate in their 30s and 16 percent received a certificate at age 40 or older.

Compared with other credentials, this is a relatively high percentage of workers who obtain certificates at an older age. For example, only 11 percent of those with Associate's degrees and 6 percent of those with Bachelor's degrees attained their degrees after age 40. The fact that a third of certificates are earned after the age of 30 demonstrates that many experienced workers burnish their credentials to seek new employment opportunities or wage increases or to train for a new career by obtaining a certificate.

Among certificate holders, 34 percent also have college degrees.

Figure 3 shows that certificate holders overlap with other degrees across the education hierarchy but are concentrated at the high school and sub-baccalaureate level. In particular, Figure 3 shows that certificates serve as a mid-level credential—between a high school diploma and a Bachelor's degree—and, correspondingly, that certificate holders are concentrated in the middle levels of educational attainment. Two-thirds of certificate holders do not have two-year or four-year college degrees. Among all certificate holders:

Figure 3. Certificates are a mid-level education credential.



- 3 percent of certificate holders don't have a high school diploma;
- 37 percent of certificate holders have a high school diploma but no college attendance⁴;
- 26 percent of certificate holders have some college but no degree.
- 19 percent of certificate holders have an Associate's degree;
- 12 percent of certificate holders have a Bachelor's degree;
- And 3 percent even have a graduate degree.⁵

Certificates can be both a stepping-stone to more education for some and an added skill credential for those who already have a college degree. Among those with an Associate's degree and a certificate, 31 percent earned a certificate after an Associate's degree, while 7 percent

4. Because these data are self-reported, some respondents said they had a certificate but did not attend college. The data reflect the ambiguity of the term "college." Most people count postsecondary institutions where certificates are typically awarded, such as community colleges, trade, vocational, or technical schools as "college" but many respondents did not.

5. These are data from SIPP; the educational attainment of certificate holders in the NLSY97 differs because, as noted in the previous footnote, many students have not completed their education. Thus the educational attainment of certificate holders in the NLSY is: 42 percent had only a high school diploma, 39 percent had some college but no degree, 6 percent had an Associate's degree and 13 percent had a Bachelor's degree.

earned both credentials in the same year.⁶ This means that the most common path (62 percent) for those with certificates and Associate's degrees was to get the certificate before the degree.

It is also interesting to note the college degree fields in which certificate holders are most concentrated. At the Associate's degree level, nearly 60 percent of those with degrees in "Other Vocational and Technical Studies" also have a certificate. Engineering, drafting, computer and information services, and health sciences represent other fields in which workers commonly pair Associate's degrees and certificates. For workers with Bachelor's degrees, there is too much variation across majors to list the specific fields.

Certificates are least concentrated among students from families with high parental education and income.

One standard measure of family background is the highest educational attainment of either parent. For individuals whose parents do not have four-year degrees, roughly 17 percent have a certificate. By contrast, among those whose parents have a four-year or graduate degree, only 10 percent have a certificate but no degree.⁷

Another indicator of family background is household income.⁸ Household income is divided into four tiers:

- **Low-income** households earned 185 percent of the poverty line or less. This is the level to which many public assistance programs are pegged and is equivalent to \$34,000 for a family of three.
- **Moderate middle-income** households earned between 185 percent and 370 percent of the poverty line or between \$34,000 and \$68,000 for a family of three.
- **Upper middle-income** households earn between 370 percent and 555 percent of the poverty line, or between \$68,000 and \$102,000 for a family of three.
- **High-income** households are defined as earning more than 555 percent of the poverty line, or families that make above \$102,000 for a family of three.

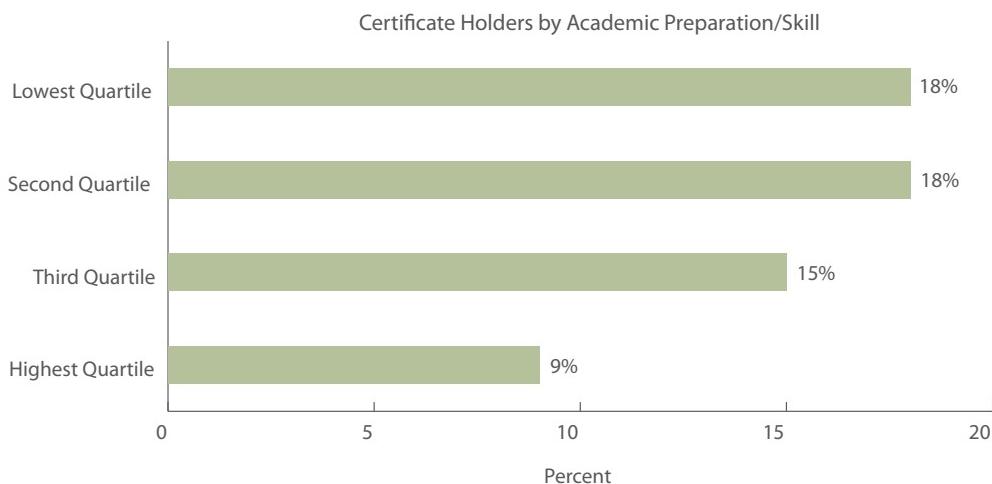
Figure 5 shows that, in the lower three family income tiers, between 14 percent and 17 percent earn certificates. For high-income households, by contrast, this figure drops to 10 percent. This relative consistency in certificates across the lower three income quartiles demonstrates that, below the top income quartile, certificates are a common labor market preparation option for children from widely different backgrounds.

6. SIPP only has year of completion for the highest education category and therefore cannot be used in this calculation of which credential came first. These results come from NLSY97, which does have complete data on the year each credential was received. This is a young cohort, however, and virtually all of the respondents with a certificate and a college degree have an Associate's degree.

7. Despite the similar incidence of certificate holding across parental education levels, large differences exist among children based on the education of their parents. For example, only 10 percent of children from families whose parents do not have a high school diploma will get a college degree, and 21 percent if at least one parent has a high school diploma. By contrast, 35 percent of children who have at least one parent with some college or an Associate's degree earn a college degree. Among children who have at least one parent with a Bachelor's degree, 61 percent earn a college degree.

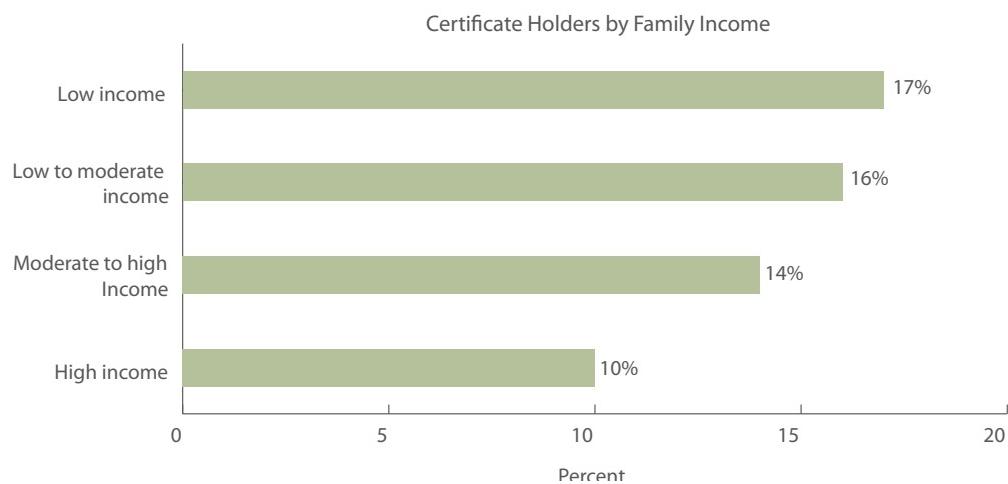
8. This metric is narrowed to the first three years of the survey when respondents' ages ranged from 12- to 19-years-old.

- **Figure 4. Workers with highest academic preparation/skill have the smallest share of certificates.**



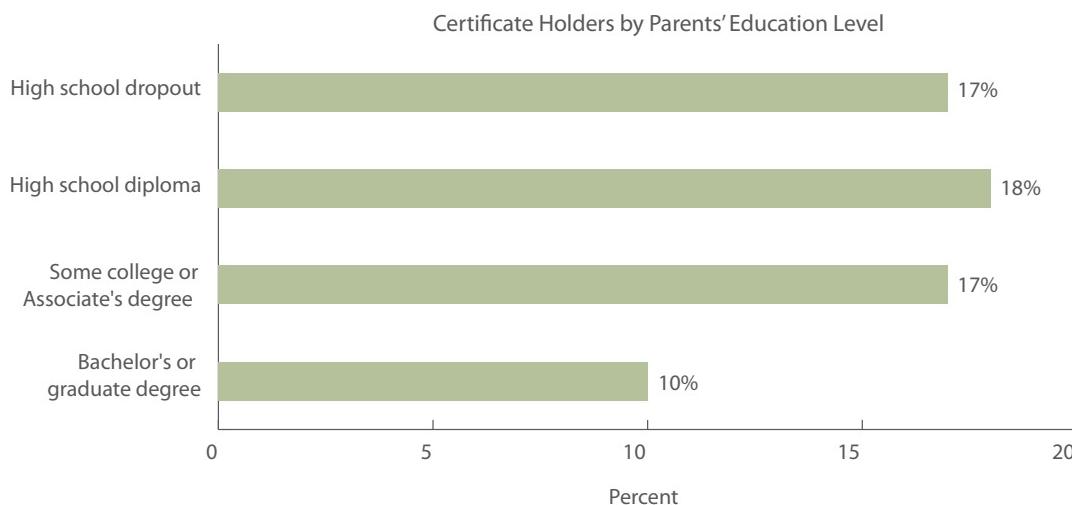
Source: National Longitudinal Survey of Youth 1997 (NLSY97)

- **Figure 5. Certificate holders tend to come from backgrounds of low to moderate family income.**



Source: National Longitudinal Survey of Youth 1997 (NLSY97)

Figure 6. Certificate holders' parents' education is typically below the Bachelor's degree level.



Source: National Longitudinal Survey of Youth 1997 (NLSY97)

Workers with the top academic preparation/skill have the smallest share of certificates.

The National Longitudinal Survey of Youth (NLSY) has a measure of student ability based on the Armed Services Vocational Aptitude Battery (ASVAB), a skills test administered in 1999. The scores on the verbal and math components are combined into one composite score and they are presented here in four ordered quartiles.⁹ As Figure 4 shows, students who score in the bottom two quartiles of the ASVAB are most likely (18 percent) to have certificates as their highest level of educational attainment. In the third quartile, 15 percent of young people obtain certificates.¹⁰ However, by this measure, young people in the highest quartile on a skills test are the *least* likely to obtain a certificate (just 9 percent).¹¹ In other words, certificates are used widely individuals in the bottom three-quarters of the skill distribution.

Figure 7 shows the full distribution of educational outcomes based on ASVAB test quartiles.

- In the lowest test quartile, certificates represent high educational attainment. Only 11 percent of individuals in this quartile are more educated than certificate holders, while 53 percent are less educated.
- In the second quartile, certificates represent above average attainment: 25 percent of these workers have a college degree, while 32 percent have a high school diploma.
- In the third quartile, certificates serve as a mid-level credential. Nearly half, 46 percent, of workers have a college degree; 24 percent have some college but no degree, and only 17 percent have a high school diploma or less.

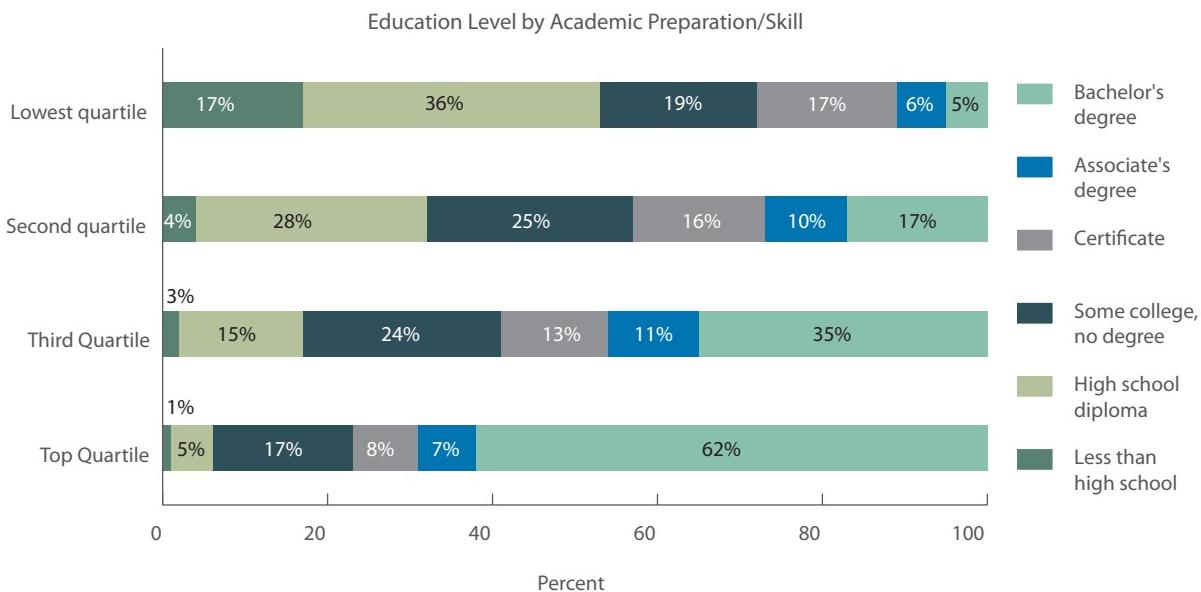
9. The test is the same used by the U.S. military and covers multiple skill areas; the scores used here are a composite based on the math and verbal components of the tests. The combined score is based on results from the following sub-tests: Mathematical Knowledge (MK), Arithmetic Reasoning (AR), Word Knowledge (WK), and Paragraph Comprehension (PC).

10. The National Education Longitudinal Survey (NELS) has similar results: 23 percent of those from the bottom test quartile were certificate holders; 17 percent from the second quartile; 8 percent from the third and 5 percent who came from the highest test quartile had certificates.

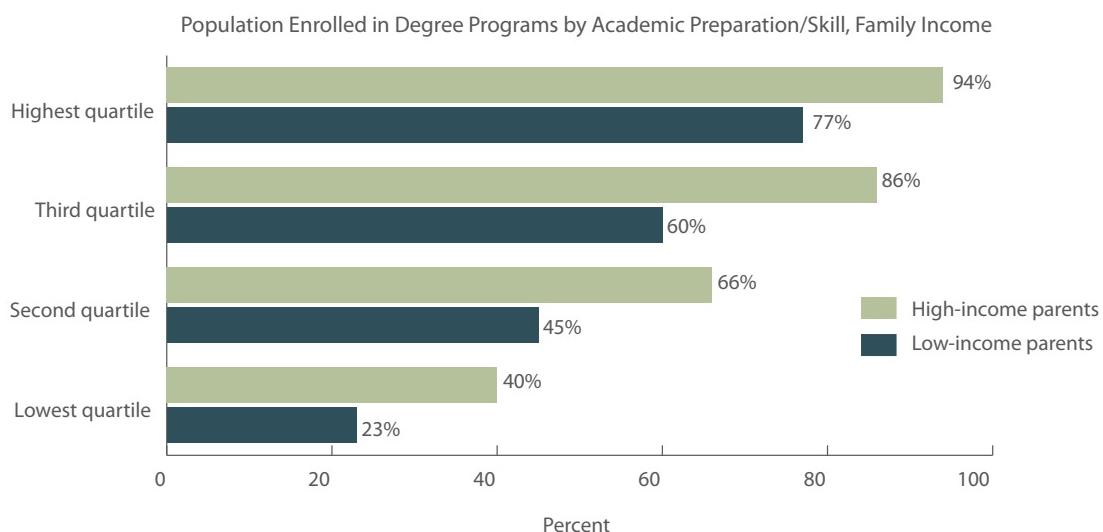
11. The incidence of Bachelor's degree attainment by ASVAB quartile rises from 3 percent for those in the bottom quartile, to 13 percent in the second quartile, to 29 percent in the third quartile, and finally to 57 percent in the top quartile.

- In the top quartile, 69 percent of workers have a Bachelor's degree or an Associate's degree and less than 6 percent have a high school diploma or less. Only in this quartile are certificates in the bottom half of the educational pyramid.

- Figure 7. Certificates are a high achievement for low-skill adults, but a low achievement for high-skill adults.**

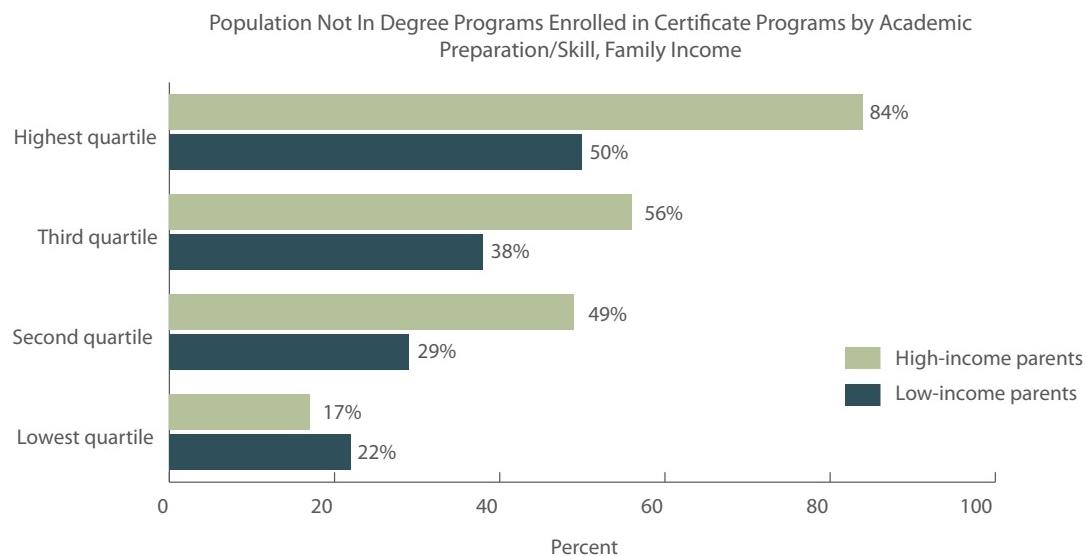


- Figure 8. Children from low-income families are less likely to enroll in college degree programs, even those with high academic preparation/skill.**



Source: National Longitudinal Survey of Youth 1997 (NLSY97)

Figure 9. Among those not enrolled in college degree programs, children from low-income families are less likely to earn certificates.



Source: National Longitudinal Survey of Youth 1997 (NLSY97)

Students from low-income families have the academic potential to earn certificates, but are not currently fulfilling their potential.

It is well understood that greater academic preparation/skill is correlated with college attendance. Conversely, this means that enrollment in college degree programs declines with preparation/skill. Figure 8 shows students from high-income and low-income families by their ASVAB scores, a measure of academic preparation/skill, and the share that enrolled in a college degree program. The figure illustrates the effect of family income on college attendance. Among students similar in academic preparation/skill, students from low-income families enroll in college at a lower rate than students from high-income families.

Figure 9 looks specifically at the population of students who do not enroll in college degree programs. The figure shows that, among students of similar academic preparation/skill, those from high-income families earn certificates at higher rates.

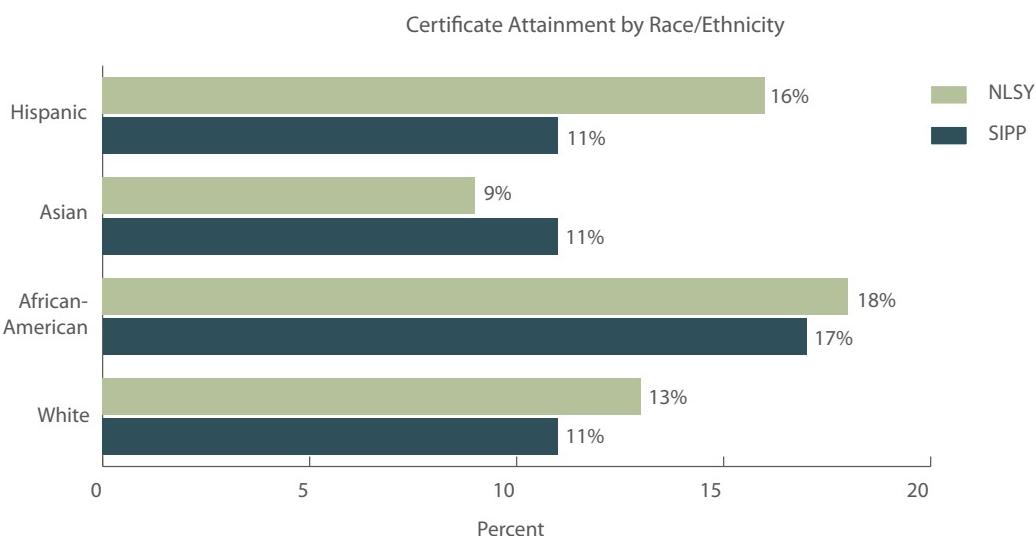
These figures suggest that students from low-income families have the academic potential to complete certificate programs, but are not fulfilling that potential. Considering that, in many cases, certificate programs do not require academic preparation beyond the 10th grade level, this suggests that certificates could add significantly to the postsecondary completion of low-income students.

Certificates are more concentrated among African-Americans and Latinos.

Although men and women earn certificates at the same rate, there are large differences based on formal education, race/ethnicity, family backgrounds, and field of study.¹² The prevalence of certificates is highest among African-Americans: 17 percent report a certificate as their highest educational attainment. Conversely, 11 percent of whites, Latinos and Asians complete a certificate program without getting a college degree (see Figure 10).¹³

The NLSY97 data, however, yield a slightly different picture, suggesting a growing importance of certificates among Latinos. At 18 percent, African-Americans are still the group with the highest incidence of certificate holding as their highest educational attainment. However, Latinos are the second most likely to have a certificate (16 percent) while non-Hispanic whites are at 13 percent and Asians at just 9 percent. These data reflect the growing numbers and share of Latinos in community colleges, proprietary schools, and other sub-baccalaureate institutions.¹⁴

● **Figure 10. Certificates are highly concentrated among African-Americans.**

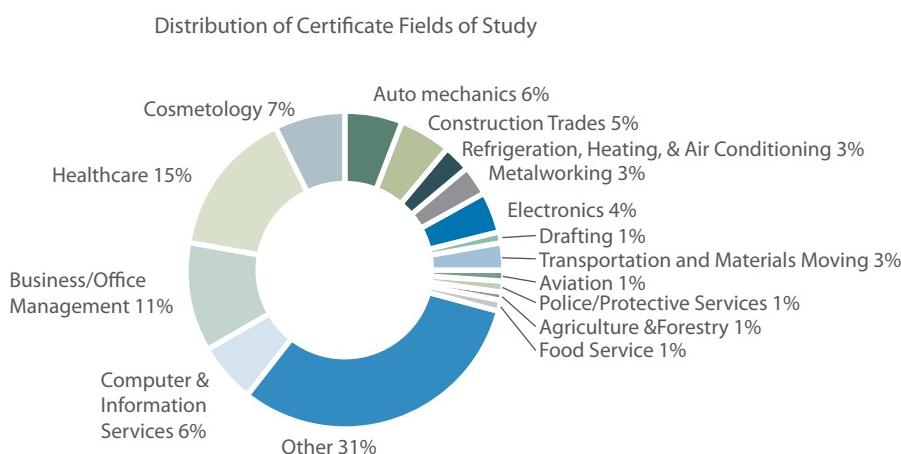


Source: Survey of Income and Program Participation (SIPP) and National Longitudinal Survey of Youth 1997 (NLSY97)

12. The data presented here are somewhat inconsistent with data on certificates from other data sources. For example, data from the Institutional Postsecondary Education Data System (IPEDS), report that women are more likely than men to get certificates and that over 30 percent of certificates are in healthcare. It is possible that many women get multiple certificates in healthcare and therefore the IPEDS data on certificate awards does not conflict so much with SIPP data based on persons who got their certificates over many years.
13. Few Hispanics have a certificate and a college degree. Therefore, Hispanics tend to use certificates as their highest degree attained more than as a launching pad or a complement to other degrees.
14. For a review of the increasing stratification in postsecondary institutions by race, ethnicity and socioeconomic status see Anthony P. Carnevale, and Jeff Strohl, "Rewarding Strivers," (The Century Foundation, 2010) http://tcf.org/publications/2010/9/how-increasing-college-access-is-increasing-inequality-and-what-to-do-about-it/get_pdf (accessed April 26, 2012).

Certificate holders' field of study is highly correlated with sex.¹⁵

Figure 11. The most popular certificate fields of study are healthcare, business/office management, cosmetology, auto mechanics, computer and information services, construction trades, and electronics.¹⁶



Source: Survey of Income and Program Participation (SIPP)

Table 1 shows that, of the 15 identified fields, 13 are segregated by sex: The share of workers of the dominant sex is 75 percent or more. Men are dominant in:

- Auto mechanics,
- Aviation,
- Construction trades,
- Drafting,
- Electronics,
- Metalworking,
- Police and protective services,
- Refrigeration, heating, and air conditioning,
- Transportation and materials moving,
- Agriculture, forestry, and horticulture.

By contrast, women are dominant in office management, cosmetology, and healthcare. Only in computer and information services and food services are men and women equally represented.

15. There are 18 separate fields of study identified, but three have very few cases in the data set (home economics, hotel and restaurant management, and marketing and distribution) and they are combined with other fields. See Part 2 for a detailed analysis on the economic returns of different fields of study.

16. According to IPEDS, over 40 percent of certificates awarded each year are in healthcare; the second most popular field is food service. The lack of consistency between the SIPP fields and these numbers is troubling.

Table 1. Certificate fields of study are segregated by sex.

| | Share of all certificates | Proportion Male | Proportion Female |
|--|---------------------------|-----------------|-------------------|
| Male Fields | | | |
| Auto Mechanics | 6% | 99% | 1% |
| Construction Trades | 5% | 99% | 1% |
| Refrigeration, Heating, & Air Conditioning | 3% | 99% | 1% |
| Metalworking | 3% | 97% | 3% |
| Electronics | 4% | 95% | 5% |
| Drafting | 1% | 92% | 8% |
| Transportation and Materials Moving | 3% | 89% | 11% |
| Aviation | 1% | 86% | 14% |
| Police/Protective Services | 1% | 81% | 19% |
| Agriculture & Forestry | 1% | 78% | 22% |
| Both Sexes¹⁷ | | | |
| Food Service | 1% | 54% | 46% |
| Other | 31% | 53% | 47% |
| Computer & Information Services | 6% | 51% | 49% |
| Female Fields | | | |
| Business/Office Management | 11% | 19% | 81% |
| Health Care | 15% | 10% | 90% |
| Cosmetology | 7% | 9% | 91% |

Source: Survey of Income and Program Participation

It is interesting to note what college degree fields have high rates of certificate holding. At the Associate's degree level, nearly 60 percent of people who got their degree in "other vocational and technical studies" also had a certificate. Other fields in which certificates are commonly paired with Associate's degrees include engineering, drafting, computer and information services, and health sciences. At the Bachelor's degree level, there is too much variation across majors to list the specific fields.

17. "Both Sexes" fields are those with concentrations of either sex below 75 percent. Neither men nor women are dominant in these fields.

The Tennessee Technology Centers

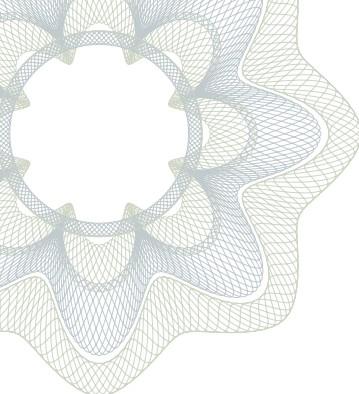
Perhaps the purest form of a higher education system based on occupational certificates is Tennessee's Technology Centers (TTC), which has 27 institutions. Because the centers are spread across the state geographically, one is in proximity to every part of the state. TTC's focus is entirely occupationally driven; there are no liberal arts or science classes. The centers offer 50 different certificate programs and provide them at a low cost of \$2,400 per year (or \$800 per trimester), and programs are designed to be completed within two years.

The student population is low-income. Over 70 percent of students come from households with incomes of less than \$24,000 per year. Because of this, nearly all the students receive Pell grants that, in addition to scholarship funds, cover the entire cost of attendance. Student loans are not offered or accepted at TTC.

TTC is known for its high completion rates and high placement rates in high skill, high wage jobs. Over 70 percent of students complete their program of study, compared to just 13 percent at the state's community colleges. Graduates are placed in field at an 83 percent rate and 95 percent of students pass certification exams on the first attempt.

What stands out about TTC are its unique program structure, learning model, and support services. Students have one or two instructors over the course of their program and have an average of six hours of face time per day with those instructors. Students' advancement through the program is based on mastery of skills rather than completion of individual course requirements. Students' choices are significantly constrained; their only decisions are their program of study, whether they attend on a full- or part-time basis, and whether they attend during the day or evening.

Remedial coursework, which often bogs down community college students, is replaced by a Technology Foundations course that all students are required to take. Students' learning is largely self-paced. TTC buildings are designed with a focus on hands-on learning, with few traditional classrooms and more "lab" space. Employers of TTC graduates report that the quality of their work is similar to others with two to three years of work experience. In addition, TTC's faculty, staff, and administration are all part of the support services offered to students. TTC reports the support system is critical to the success of students from low-income communities.



Part Two:

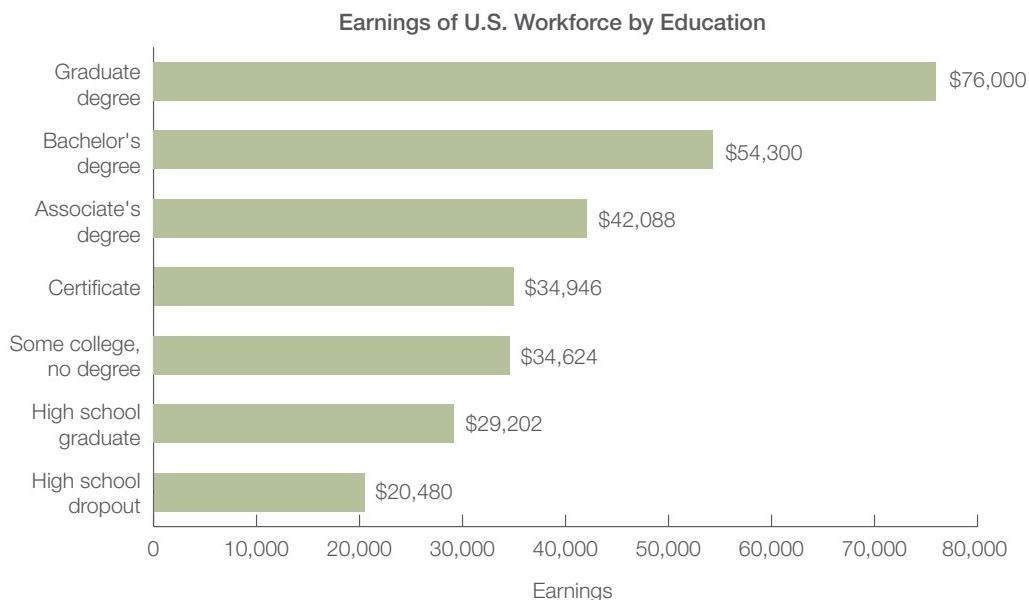
EARNINGS RETURNS TO CERTIFICATES

Because certificates serve as a convenient and efficient way to improve American workers' lifetime earnings, they have grown in popularity in the United States over the past three decades.

High school graduates receive a 20 percent wage premium from a certificate.

Figure 12 shows the progression of earnings for each level of educational attainment for all workers (SIPP data).¹⁸ The median worker with a high school diploma earns slightly more than \$29,000, while certificate holders earn slightly less than \$35,000, meaning that the certificate premium over high school is 20 percent.¹⁹ As detailed in Part 1, one-third of certificate holders have a college degree, primarily two-year degrees. These workers do not qualify as having a certificate as their highest educational attainment. The combination of a certificate and a degree has a mild positive effect: a 6 percent premium at the Associate's degree level, 3 percent at the Bachelor's degree level, and no discernible effect at the graduate level.

- **Figure 12. On average, certificate holders earn roughly the same as workers with some college, but no degree.**



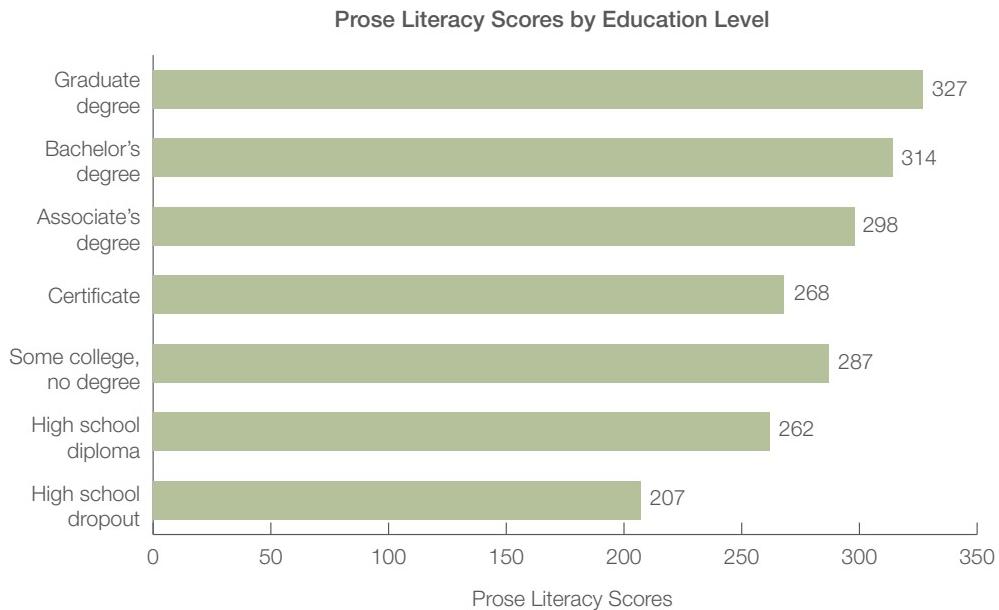
Source: Survey of Income and Program Participation

18. Almost all of the earnings comparisons in Part 2 are based on the SIPP because the NLSY only tracks earnings until age 27 and lacks information on field of study.

19. In Appendix B, regression analysis is used and adjusts for age and other demographic information. The resulting certificate premium over high school graduate earnings is 19 percent.

As Figure 12 shows, certificate holders' earnings are similar to those of workers with some college but no degree, and at the midpoint between a high school diploma and an Associate's degree. Because high-paying jobs recruit from college graduates, young people who are successful in high school go to college in high numbers to be better placed to get the best jobs. In college, these students build on their high school advantage by developing new general and specific knowledge.

Figure 13. Certificate holders are academically similar to high school graduates.



Source: National Longitudinal Survey of Youth 1997, NLSY97

Certificates benefit workers with less academic preparation/skill.

Figure 13 represents the results from a "prose literacy" test developed by the 2003 National Assessment of Adult Literacy (NAAL). It shows that certificate holders' academic preparation/skill is only slightly above high school graduates' and considerably less than those with some college but no degree. Yet, Figure 12 shows that certificate holders' earnings are slightly greater than workers with some college but no degree and significantly more than high school educated workers.

These findings indicate that certificate holders acquire job-specific skills that are rewarded in the labor market above and beyond their general academic skills and that certificate programs are an efficient option for high school graduates with average and below average grades.²⁰

20. The same relationship exists for the NLSY97 with the results of ASVAB scores by educational level: 75 percent of high school graduates with no college score in the bottom half of ASVAB versus 61 percent for certificate holders and 48 percent for those with some college and no degree.

Over the course of a lifetime, high school graduates will earn about \$1.3 million, compared with just over \$1.7 million for those with a two-year degree. The data set used to make these calculations does not have information on certificates. However, annual earnings figures can be used to estimate that certificate holders earn \$240,000 more than high school educated-workers over the course of a lifetime, roughly the same as those with some college and no degree.

The earnings among certificate holders vary significantly.

So far, the numbers used to illustrate earnings have been median values—single numbers that represent a dataset. In reality, there is wide variation in the earnings of certificate holders based on sex, field of study, race/ethnicity, and occupation.

Some certificate holders' earnings are comparable to workers with college degrees. For example, 39 percent of male certificate holders earn more than the median male worker with an Associate's degree and 24 percent earn more than the median male Bachelor's degree holder. Among women with certificates, 34 percent earn more than the median woman with an Associate's degree and 23 percent earn more than the median woman with a Bachelor's degree.

Male certificate holders who work in high-earning fields of study do as well as many with men with Bachelor's degrees.

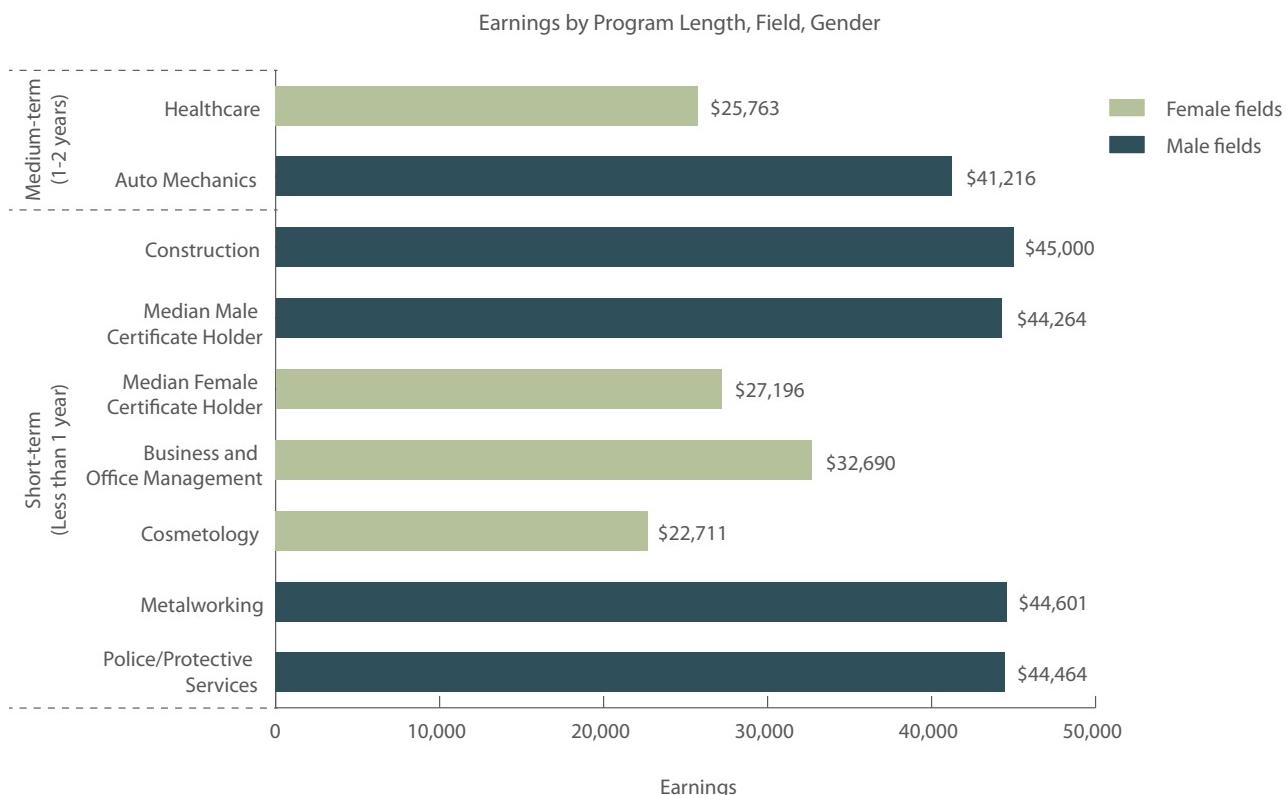
- Men with certificates in electronics earn more than 65 percent of male Associate's degrees holders and 48 percent of male Bachelor's degree holders.
- Men with certificates in computer and information services earn more than 65 percent of men with Associate's degrees and 44 percent of men with Bachelor's degrees.

Short-term certificates do not guarantee low pay, while medium-term certificates do not guarantee high pay.

Because certificates are typically classified by program length (the amount of instructional time required to complete a program of study), policymakers and practitioners have thought of this as a natural way to classify certificates' economic value. Based on several small-scale studies conducted at the state level, it has been suggested that short-term certificates, which require less than one year of instructional time, have little economic value.

This hypothesis has been difficult to test since no national dataset that includes earnings, field of study, and program length is yet available. Data from IPEDS include the field of study of certificates and program length. Using this data, fields that had a high or low concentration of short-term certificates were identified. Using national earnings data from the SIPP, the differences in pay among these fields were examined.

Figure 14: Short-term certificates do not guarantee low pay, while medium-term certificates do not guarantee high or average pay.



Source: Survey of Income and Program Participation (SIPP) and Integrated Postsecondary Education Data System. For full detail of methodology, see Appendix J.

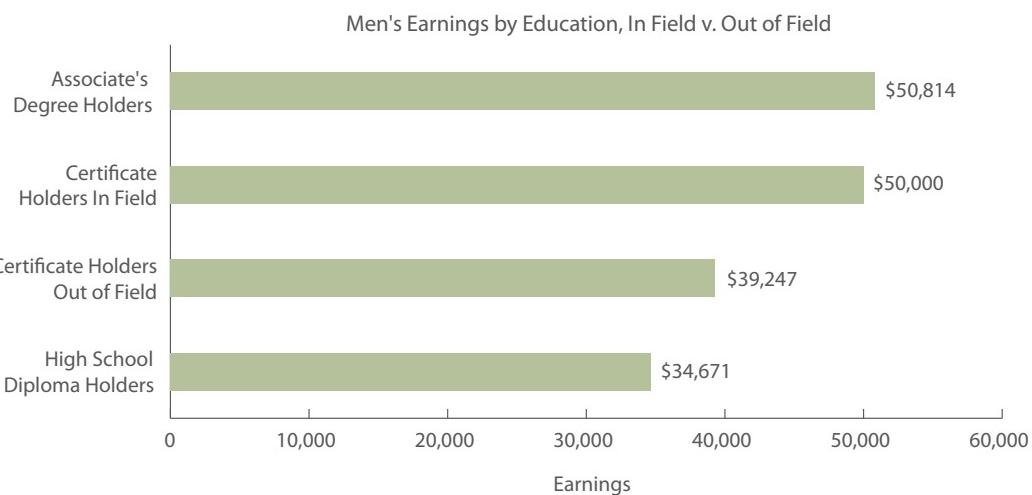
Healthcare is both the largest certificate field and predominantly female. It also has a high concentration of short-term certificates (requiring less than a year to complete) and offers below average pay for female certificate holders. However, after removing healthcare, the relationship between earnings and program length largely disappears. In other words, the conventional wisdom—that short-term certificates have little economic value—is not the best way to understand the differences in the value of certificates.

Some certificate fields that consist predominantly of short-term certificates, such as police and protective services, computer and information services, agriculture, and business and office management offer large earnings premiums. Conversely, cosmetology consists predominantly of medium-term certificates (requiring one to two years to complete), but offers lower wages than those of high school-educated workers.

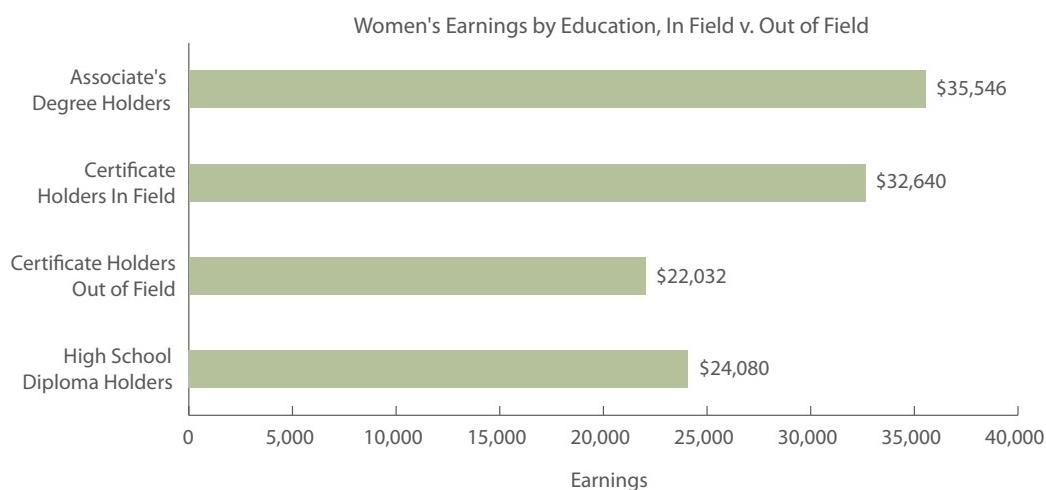
Working in an occupation that is closely related to one's training is the key to leveraging a certificate into substantial earnings returns.

Among certificate holders, 44 percent have occupations related to their certificate, and these occupation matches earn 31 percent more than those who aren't in a related occupation.²¹ The share of certificate holders who work in field varies from 62 percent in business and office management to 22 percent in cosmetology, agriculture, forestry and fishing. Certificate holders who work in field earn 37 percent more than those with just a high school diploma and are within 4 percent of workers with an Associate's degree. Certificate holders working out of field earn 1 percent higher than workers with a high school diploma and no postsecondary education.

- **Figure 15. Men with certificates who work in field earn approximately as much as men with Associate's degrees.**



- **Figure 16. Women with certificates who work out of field earn less, on average, than women with high school diplomas.**



21. See Sarah Crissey and Kurt Bauman, 2010, for a similar analysis of the in-field premium of certificate holders. Using the SIPP 2001 and 2004 panels, they used the Classification of Instructional Programs (CIP) and the Standard Occupational Classification (SOC) developed by the National Crosswalk Service Center to align occupations to certificate fields of study.

However, the share of people who work in field and the in-field premiums vary substantially across different fields (Table 2). For example, in business and office management (a field that comprises mostly women), 62 percent had an in-field occupation and they earned 64 percent more than workers who worked outside this field.²² Similarly, among certificate holders in police and protective services, a predominantly male field, 46 percent worked in field, and they earned 68 percent more than those who were not in field.

The very high in-field premiums in aviation (73 percent), computers and information services (115 percent), and electronics (60 percent) occur because these skills are best used in a narrow set of occupations. By contrast, because of the low pay in food service occupations, it is actually better to work out of field. A similar situation occurs in cosmetology (in-field premium of 9 percent) and agriculture (premium of 8 percent). However, in a few cases involving male blue-collar workers, e.g., metalworking and refrigeration and related fields, the pay is high and the in-field premium is low because these skills can be used in occupations outside the narrow in-field list.

Table 2. Certificate holders who work in their field of study get a significant earnings premium.

| Field of Study | Share of certificates | Share in field | In-field earnings | In-field earnings premium |
|---|-----------------------|----------------|-------------------|---------------------------|
| All | | 44% | \$40,420 | 37% |
| Computer and Information Services | 9% | 15% | \$70,400 | 115% |
| Aviation | 1% | 40% | \$65,642 | 73% |
| Police/Protective Services | 2% | 46% | \$55,499 | 68% |
| Business/Office Management | 17% | 62% | \$40,000 | 66% |
| Electronics | 6% | 42% | \$61,668 | 60% |
| Drafting | 1% | 44% | \$59,592 | 56% |
| Transportation and Materials Moving | 5% | 58% | \$44,336 | 38% |
| Healthcare | 21% | 54% | \$30,577 | 35% |
| Auto Mechanics | 9% | 46% | \$45,586 | 30% |
| Construction Trades | 8% | 42% | \$50,989 | 25% |
| Refrigeration, Heating, or Air Conditioning | 4% | 38% | \$53,850 | 18% |
| Cosmetology | 11% | 23% | \$25,217 | 9% |
| Agriculture/Forestry/Horticulture | 1% | 20% | \$47,800 | 8% |
| Metalworking | 4% | 49% | \$45,040 | 2% |
| Food Service | 2% | 31% | \$17,600 | -41% |

Source: Survey of Income and Program Participation (SIPP)

22. Because many female certificate holders are in business and office management, the effect of this high premium results in women having an in-field premium that is 6 percentage points higher than men.

Female certificate holders are concentrated in a few fields and earn much less than male certificate holders.

Because of the enormous discrepancy between the certificates that men and women hold, certificate fields of study by men and women are examined separately. As Table 3 shows, the most common fields for men with certificates are:

- Auto Mechanics,
- Construction Trades,
- Computer and Information Services,
- Transportation and Materials Moving,
- Business and Office Management.

With few exceptions, the earnings variation across fields with male workers is rather small. The few men who have certificates in cosmetology and food services have earnings 20 percent below the average for male certificate holders as a group. The most lucrative certificates are those with the highest concentrations of males including:

- Refrigeration, Heating or Air Conditioning (\$49,582),
- Drafting (\$48,422),
- Aviation (\$48,084),
- Electronics (\$47,488).

Table 3. Male certificate holders' earnings are high across all fields, except cosmetology and food service.

| Certificate field | Median Earnings | Share of all Certificates | Relative Earnings to all Male certificate holders |
|---|-----------------|---------------------------|---|
| All | \$43,770 | | |
| Refrigeration, Heating, or Air Conditioning | \$49,582 | 4.8% | 13% |
| Drafting | \$48,422 | 1.7% | 11% |
| Aviation | \$48,084 | 1.6% | 10% |
| Electronics | \$47,488 | 7.6% | 9% |
| Agriculture/Forestry/Horticulture | \$46,736 | 1.3% | 7% |
| Computer and Information Services | \$45,461 | 5.8% | 4% |
| Construction Trades | \$45,000 | 10.4% | 3% |
| Metalworking | \$44,601 | 5.2% | 2% |
| Police/Protective Services | \$44,464 | 2.1% | 2% |
| Business and Office Management | \$44,116 | 4.3% | 1% |
| Transportation and Materials Moving | \$43,628 | 5.4% | 0% |
| Other Fields, not specified | \$42,632 | 31.6% | -3% |
| Healthcare | \$41,455 | 2.9% | -5% |
| Auto mechanics | \$41,216 | 12.3% | -6% |
| Cosmetology | \$34,929 | 1.3% | -20% |
| Food Service | \$31,890 | 1.6% | -27% |

Source: Survey of Income and Program Participation (SIPP)

Women workers with a certificate as their highest educational attainment are concentrated in just seven fields (see Table 4). Most women with certificates are found in just four fields including:

- Business and Office Management,
- Cosmetology,
- Healthcare,
- Computer and Information Services.

Table 4: Female certificate holders' earnings are low, especially in food service and cosmetology.

| Certificate field | Distribution | Median earnings | Relative earnings to all female certificate holders |
|-------------------------------------|--------------|-----------------|---|
| All | | \$27,191 | |
| Business/Office Management | 19% | \$32,690 | 20% |
| Computer and Information Services | 6% | \$29,986 | 10% |
| Police/Protective Services | 1% | \$27,761 | 2% |
| Other Fields, not specified | 30% | \$26,938 | -1% |
| Healthcare | 28% | \$25,753 | -5% |
| Transportation and Materials Moving | 1% | \$25,686 | -6% |
| Cosmetology | 14% | \$22,711 | -17% |
| Food Service | 1% | \$20,974 | -23% |

Source: Survey of Income and Program Participation (SIPP)

Women with certificates make substantially less than men, even when men and women work in the same fields. In the most striking example, men with certificates in cosmetology, one of the lowest paying fields for men, earn more than women with certificates in business and office management, the highest-paying field for women.

Notably, the two fields with connections to office work—business and office management and computer and information services—have earnings above average for women, while cosmetology and healthcare offer below average earnings.

Compared to women with a high school diploma and no postsecondary education, women with healthcare certificates earn slightly more (5 percent) and women with a cosmetology certificate earn less (1 percent). This raises the question of why women would go through training to end up with no or very little earnings' boost. There are four possible answers. First, there are many part-time opportunities for women in these fields and they may have chosen the fields for the added convenience of being able to set their hours or to move in and out of the labor force. Hence their lower earnings can be due to fewer hours worked. Second, there are few medium-paying medium-skilled jobs available to women without at least a two-year college degree. Third, as noted previously, it may be overly simplistic to compare the earnings of certificates holders to the earnings of average high school graduates. It is possible that the alternative for low-skill certificates is not at the level of the typical high school graduate.

A final possibility is that these workers aren't obtaining certificates just for the money. Rosenbaum (2011) finds that certificates lead to nonmonetary payoffs, such as job freedom, career relevance, and work stress. A cosmetology certificate, for example, provides personal service skills that may allow women to work in the home or allow a more flexible appointment-based schedule. Certificates may give women more job continuity and flexibility even though the pay is not much different than the median earnings of women with just a high school diploma.

The earnings premium from a certificate differs for men and women.

While male certificate holders have median earnings 27 percent higher than men with just a high school diploma, the certificate bump for women is just 16 percent (see Table 5).²³ This is a departure from the norm for those with degrees, for whom the earnings premiums over high school are mostly identical for men and women.

Table 5. Hispanics receive the largest wage premium from certificates, while African-Americans receive the smallest.

| Race/Ethnicity | Earnings of High School Educated Worker | Earnings of Certificate Holder | Certificate Premium Over High School (%) |
|------------------|---|--------------------------------|--|
| Women | | | |
| All | \$24,020 | \$27,864 | 16% |
| White | \$26,011 | \$29,653 | 14% |
| African-American | \$22,421 | \$24,887 | 11% |
| Asian and other | \$22,160 | \$26,592 | 20% |
| Hispanic | \$19,086 | \$26,911 | 41% |
| Men | | | |
| All | \$34,796 | \$44,191 | 27% |
| White | \$39,107 | \$47,320 | 21% |
| African-American | \$27,559 | \$35,000 | 27% |
| Asian and other | \$30,966 | \$38,398 | 24% |
| Hispanic | \$27,718 | \$39,914 | 44% |

Source: Survey of Income and Program Participation (SIPP)

African-American certificate holders receive the lowest wages and the smallest wage premium.

A certificate *premium* is computed by comparing the earnings of certificate holders to the earnings of those with just a high school diploma. This ratio relies on two figures: the earnings of workers with only a high school diploma and those with a certificate. A high premium, therefore, could indicate high earnings for certificate holders, low earnings for high school educated workers, or a mix of both.

23. The more rigorous computation using multivariable regression analysis of certificate earnings relative to high school graduate earnings arrives at the same premium and is presented in Appendix B.

Hispanic workers with certificates earn slightly less than white workers with certificates, but have a much greater earnings premium because high school-educated Hispanic workers' earnings are very low. Conversely, white workers with certificates receive a relatively low premium because their high school-educated counterparts' earnings are relatively high. White men in particular have much higher earnings at the high school and certificate levels, indicating an enormous advantage over other races/ethnicities in the low- to low-middle tiers of the occupational ladder.

Among African-American workers with high school diplomas, women earn more than Hispanic and Asian women with high school diplomas, while men have the lowest earnings. However, at the certificate level, African-American men and women have the lowest earnings among racial groups.

State-based and Community College Certificate Reports

Though relatively little national data are available on certificates compared to other credentials, numerous individual states and community colleges have conducted their own research on the value of certificates.

By and large, these reports reinforce the information in population surveys and other data systems: Certificates offer a significant earnings premium over a high school diploma (see Appendix 3). For example, a 2009 study of Washington state community and technical colleges found that certificates provide an earnings premium of \$4,214, or 16 percent more than a high school diploma.

While these reports do not go into as much depth as this report, some examine certificate holding by program length and sex. A report on Illinois' community colleges found that certificates requiring less than 30 credit hours provided a \$8,436 premium on immediate annual earnings, while a certificate requiring more than 30 credit hours provided a premium of \$11,094. A report on Kentucky certificates found a significant sex gap in earnings—as this report has—and that short-term certificates provided an earnings benefit significantly less than medium-term certificates. However, reports on other states and community colleges found a significant earnings premium for both short- and medium-term certificates.

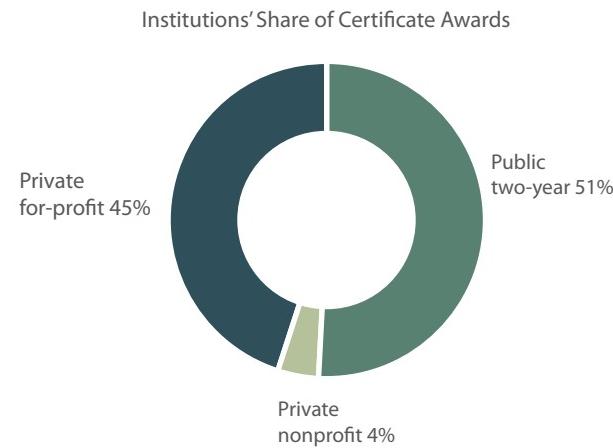
While the findings in these reports differ in detail, they provide additional evidence of the benefits certificates bring, despite their differences from state to state.

Part 3:

WHERE DO STUDENTS EARN CERTIFICATES?

Three kinds of institutions are primarily responsible for awarding certificates: private for-profit, and public and private nonprofit schools. Almost all of the public institutions are community colleges.²⁴ Public institutions award 52 percent of certificates; private for-profits award 44 percent; private nonprofits award 4 percent. Most of these institutions are classified as two-year institutions. Private nonprofit institutions often focus on providing specialized training for healthcare occupations. Other private nonprofit institutions include occupational colleges, which evolved from business and vocational schools.

Figure 17. Certificate programs are based predominantly in two-year public and private for-profit schools.



Source: Integrated Postsecondary Education Data System (IPEDS) 2010

These institutions vary in the kinds of certificates they award based on field of study and instructional time:

- Healthcare certificates represent nearly half of all certificates awarded in 2010 (46 percent), but they represent 57 percent of certificate awards at for-profit institutions. By comparison, 37 percent of certificates awarded at public institutions and 39 percent at private nonprofits were in healthcare fields.
- For-profits also award 87 percent of all cosmetology certificates, representing 20 percent of all certificate awards at for-profit institutions.
- Public institutions award 69 percent of certificates in blue-collar work, which represent 27 percent of certificates awarded by public institutions, compared with only 20 percent by private nonprofit institutions and 12 percent by for-profits.

24. To remind the reader, baccalaureate and graduate certificates are not included in this report's definition of certificates.

- Public institutions also award a large share—74 percent—of certificates in business and information technology (“office work”) occupations. These certificates constitute 18 percent of certificate awards at both public and private nonprofit institutions, but only 6 percent at for-profits.
- Public institutions are also more likely to integrate certificates into broader degree programs, such as an Associate of Arts (A.A.) or Associate of Science (A.S.) degree. In these cases, certificates typically represent a stepping stone toward a further degree, but typically have little value alone.

These figures show that (77 percent of) healthcare and cosmetology certificates are highly concentrated at for-profits institutions, while manual labor and business certificates are concentrated elsewhere. Public and nonprofit institutions also award many healthcare certificates but have a more diverse array of certificate programs than for-profit institutions. Partly based on these differences, public institutions have a higher concentration of short-term certificate programs (60 percent) than either private for-profit institutions (48 percent) or private nonprofit institutions (47 percent).

For-profit institutions are a relatively new and growing part of the educational landscape. At the four-year level, they have specialized in online learning and occupationally focused majors. At the sub-baccalaureate level, for-profits rarely offer general education or liberal arts programs. Their business model relies heavily on advertising and their ability to arrange federal grants and loans for their students.

For-profits charge higher fees and their students have higher loan default rates. As a result, they have been criticized for accepting public funds in the form of subsidized federal grants and loans, while leaving many students with thousands of dollars in debt. In response, the Department of Education issued “Gainful Employment” regulations. The regulations mandate that institutions offering programs with the primary purpose of gainful employment—including most programs at for-profits and certificate and vocational programs at nonprofit institutions—report wage and employment outcomes by program and school and maintain strict performance standards to continue to participate in federal aid programs.

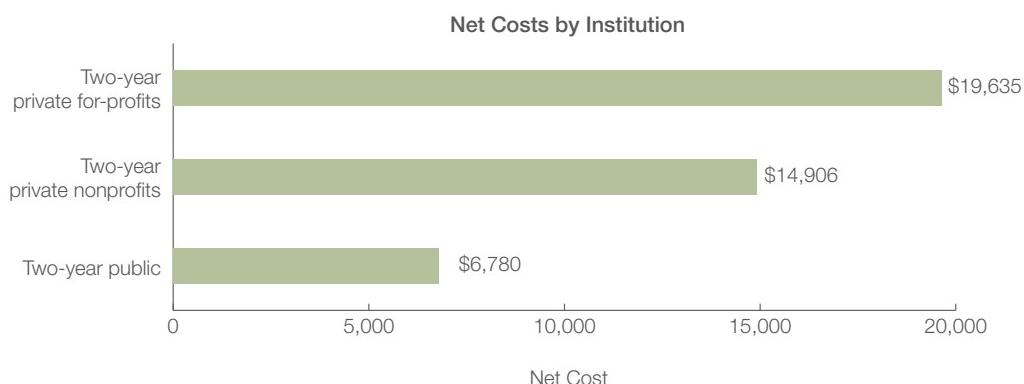
Some have defended for-profits as being more nimble and more consumer friendly because they respond to market needs by developing new programs and scheduling classes that fit their customers’ needs. Deming, Goldin, and Katz (2011) best summarize the costs and benefits provided by the for-profit institutions:

We find that relative to community colleges and other public and private nonprofits, for-profits educate a larger fraction of minority, disadvantaged, and older students, and they have greater success at retaining students in their first year and getting them to complete shorter degree and non-degree programs at the certificate and Associate’s degree levels. But we also find that for-profits leave students with far larger student loan debt burdens. For-profit students end up with higher unemployment and ‘idleness’ rates and lower earnings from employment six years after entering programs than do comparable students from other schools. (Deming, Goldin, and Katz, 2011).

Net costs at for-profits are significantly higher than at public two-year institutions.

When deciding whether to pursue a credential, the benefits the credential brings—such as a wage premium and greater employability—are not all that matters. Program costs matter as well, particularly because most students finance higher education through student loans. Concerns are increasing about the amount of debt students are taking on as the federal government cuts back its subsidized loan programs, resulting in higher interest rates for students.

Figure 18. Public two-year institutions net costs are lower than private institutions.



Source: National Center for Education Statistics (NCES)

Figure 18 shows the net cost — the cost after student aid, including grants and scholarships — of attending the kinds of institutions largely responsible for awarding certificates: public two-year colleges, private nonprofit two-year institutions, and private for-profit two-year institutions. The costs of attending public two-year schools are much less than private schools: less than \$7,000 annually at public schools, \$15,000 annually at private nonprofits, and almost \$20,000 annually at private for-profits.

The differences are based on several factors. First, public schools have free rent because the land and buildings are provided by the states or local jurisdictions. Second, public two-year institutions are subsidized by substantial state funding under the premise that a more educated citizenry is good for the economy of the state. Third, private for-profit schools spend more than a quarter of their budgets on sales and advertising and have to generate enough revenue to earn a profit. As a consequence, the costs of for-profits are nearly three times the cost of public two-year schools, leading to much higher debts for the students who attend for-profits.

Going forward, some of this gap may shrink as state governments decrease funding to public schools because of budgetary constraints. Over the past several years, however, public two-year institutions have controlled the growth of costs better than for-profit institutions. While the net cost of attending for-profit institutions grew by nearly 12 percent from 2007 to 2009, costs increased by only 6 percent at public institutions in the same period.

States differ in the prevalence of workers with certificates, production of certificate awards, institutional makeup, and how often certificates pay off.

Because limited data are available at this point, it is difficult to assess the implications of the differences between states. More research is necessary to go beyond a tertiary understanding of these differences. Nevertheless, the differences in the extent to which states utilize certificates and workers with certificates, as well as the strength of certificate-awarding institutions, are interesting and worth discussing.²⁵

State economies differ in the prevalence of workers who report certificates as their highest level of education.

Because of the differences in state economies and education institutions, the share of certificates as the highest educational attainment varies between a high of 18 percent in Oklahoma and a low of 6 percent in Nebraska. The states with the highest shares of workers with certificates are Wyoming, South Dakota, Louisiana, and Pennsylvania. North Carolina, New York, Utah, and Illinois have the smallest shares of workers with certificates.

Table 6. Oklahoma and Wyoming have high concentrations of workers with certificates.

| Top 10 States by Share of Labor Force with Certificates | |
|--|--|
| State | Share of Workers with a Certificate |
| Oklahoma | 18.0% |
| Wyoming | 17.4% |
| South Dakota | 14.0% |
| Louisiana | 13.8% |
| Pennsylvania | 13.7% |
| Minnesota | 13.4% |
| Nevada | 12.7% |
| Florida | 12.5% |
| Montana | 12.4% |
| Missouri | 12.3% |

Source: Integrated Postsecondary Education Data System (IPEDS) 2010

Table 7. Nebraska and North Carolina have small shares of workers with certificates.

| Bottom 10 States by Share of Labor Force with Certificates | |
|---|--|
| State | Share of Workers with a Certificate |
| Nebraska | 6.1% |
| North Carolina | 8.1% |
| New York | 8.2% |
| Utah | 8.3% |
| Illinois | 8.3% |
| Oregon | 8.4% |
| Alabama | 8.6% |
| Vermont | 8.7% |
| Rhode Island | 8.7% |
| New Mexico | 8.7% |

Source: Survey of Income and Program Participation

The next section presents information on state production of certificates and shows that some states with the highest production—such as Kentucky, Arizona, and Georgia—do not have the largest share of workers with certificates. Those who earn certificates may pursue further education or migrate to a different state after earning a certificate. Similarly, the overlap between low certificate shares among workers and low certificate production is low. New York and Alabama produce a small number of certificates relative to their population and have a small proportion of workers with certificates. But, overall, the lowest certificate-producing states are not the same as the states with the smallest shares of workers with certificates. This suggests

25. State data utilize both SIPP and IPEDS. A complete list of state data and explanations of their sources is provided in Appendices 6-10.

that some states benefit from workers with certificates who aren't homegrown.

Another way to look at state data on certificates is to see whether certificates are part of labor forces that have many workers with postsecondary education or whether certificates are high when the shares of college graduates are low. Overall, states that rank high in workers with certificates usually rank low in workers with college degrees (Associate's, Bachelor's or graduate). Conversely, states with a high share of workers with college degrees usually have low shares of workers with certificates. In other words, workers with certificates are concentrated in the same states as workers with high school diplomas and some college, but no degree, while workers with Associate's degrees, Bachelor's degrees, and graduate degrees also are grouped together.²⁶ Some states serve as noteworthy counterexamples to these trends: for example, Minnesota ranks sixth in its share of workers with certificates and third in its share of Bachelor's degree workers while South Dakota ranks third in its share of workers with certificates and in the top half (20th) in college degrees, though it ranks 47th in workers with graduate degrees.

Finally, certificates and Associate's degrees are often grouped together because two-year institutions typically award them, but workers with certificates or Associate's degree are most highly concentrated in different states. In other words, if a state is ranked high in workers with certificates, it does not mean that the state will be ranked high in workers with Associate's degrees. For example, of the top 10 states with workers with certificates:

- Oklahoma is ranked first in workers with certificates, but 37th in workers with Associate's degrees.
- Louisiana is ranked fourth in workers with certificates, but 50th in workers with Associate's degrees.
- Nebraska is ranked first in workers with Associate's degrees, but 51st in workers with certificates.
- Utah is ranked fifth in workers with Associate's degrees, but 48th in workers with certificates.

States vary in their production of certificates.

Another way to show the variation by state is to look at the number and share of certificates that were issued in 2010. One direct measure is the number of certificates awarded per 10,000 in population: this number ranges from 50 certificates for every 10,000 population in Kentucky to only six per 10,000 in Hawaii. Other states with high production of certificates include Arizona, Georgia, Louisiana, and Florida; and other states with low production are Vermont, Montana, Maine, and New Hampshire.

In terms of regions, four out the top five certificate-producing states—Kentucky, Georgia, Louisiana, and Florida—are located in the Southern region of the country. However, two other southern states, Alabama and Mississippi, are in the bottom 10 in certificate production. On the other hand, the Northeast region is absent from the top 10 certificate states. In New England, four-year institutions are strong and, for many, a college degree is the expectation. New York, New Hampshire, Maine, and Vermont are among the 10 lowest-producing certificate states.

26. High school dropouts are spread among both groups, but are slightly more concentrated in states that have larger shares of degree workers.

Table 8. Four out of the top five certificate-awarding states are in the southern U.S.

| Top 10 States by Certificate Awards Per 10,000 Population | |
|---|--|
| State | Certificate Awards per 10,000 Population |
| Louisiana | 67 |
| Kentucky | 50 |
| Georgia | 50 |
| Arizona | 50 |
| Florida | 45 |
| Arkansas | 41 |
| Washington | 40 |
| Kansas | 40 |
| California | 37 |
| Illinois | 37 |

Source: Integrated Postsecondary Education Data System (IPEDS) 2010; U.S. Census, 2010.

Table 9. Hawaii, Vermont, and Montana award very few certificates.

| Bottom 10 States by Certificate Awards Per 10,000 Population | |
|--|--|
| States | Certificate Awards Per 10,000 Population |
| Hawaii | 6 |
| Vermont | 8 |
| Montana | 8 |
| Maine | 11 |
| New Hampshire | 14 |
| District of Columbia | 15 |
| Idaho | 15 |
| Alabama | 15 |
| South Dakota | 15 |
| Mississippi | 15 |

Source: Integrated Postsecondary Education Data System (IPEDS) 2010; U.S. Census, 2010.

The strength of for-profits and public two-year institutions varies from state to state.

As noted above, the institutions primarily responsible for awarding certificates are public two-year institutions (typically community colleges) and private for-profit institutions. There are enormous differences in the relative strength of these institutions from state to state. In Wisconsin, public two-year colleges award 84 percent of certificates; in Rhode Island, they award only 9 percent. For-profits award 88 percent of certificates in New Jersey, but only 13 percent in Arkansas.

Table 10 shows the states where for-profit institutions award the largest shares of certificates. Seven of the top 10 states are located in the Northeast region of the United States. Since the public institutions in the Northeast tend to be four-year universities, for-profit institutions fill in the supply gap for lower level postsecondary credentials.

Table 11 shows the top 10 states where public two-year institutions award the highest shares of certificates. Six of these 10 states are located in the Southern region of the United States. Wisconsin and Minnesota are notable in that they have both strong public four-year institutions and strong public two-year colleges.

Table 10. For-profit institutions award a larger share of certificates in the Northeastern United States.

| Top 10 States by Share of Certificates Awarded by For-Profit Institutions | |
|--|---|
| State | For-Profits' Share of Certificate Awards |
| New Jersey | 87.0% |
| Nevada | 86.8% |
| Rhode Island | 82.4% |
| Connecticut | 75.3% |
| Massachusetts | 67.9% |
| Maryland | 67.7% |
| Missouri | 66.4% |
| New York | 65.9% |
| Pennsylvania | 65.5% |
| Texas | 65.2% |

Source: Integrated Postsecondary Education Data System (IPEDS) 2010.

Table 11. Public two-year colleges award a large share of certificates in the Southern United States.

| Top 10 States by Share of Certificates Awarded by Public Two-Year Colleges | |
|---|--|
| State | Public Two-Year Colleges' Share of Certificate Awards |
| Wisconsin | 84.2% |
| Arkansas | 82.5% |
| Kentucky | 82.3% |
| North Carolina | 81.9% |
| Georgia | 78.7% |
| South Dakota | 78.5% |
| South Carolina | 77.4% |
| Minnesota | 76.3% |
| Louisiana | 73.9% |
| Washington | 72.3% |

Source: Integrated Postsecondary Education Data System (IPEDS) 2010.

Some states do better than others at producing certificates that have value in the labor market.²⁷

In North Dakota, Rhode Island, and Montana, 65 percent of certificates have significant earnings returns in the labor market, while in South Carolina, only 41 percent of certificates do. Other states with high shares of certificates with high returns include South Dakota, Idaho, and Nebraska, and states with low shares are Colorado, New Hampshire, Louisiana, and Illinois.

How much value a certificate has depends on many factors, such as local labor market demand for middle-skill jobs. In some states, certificates offer a large wage premium, while in other states workers with certificates don't do much better than high school graduates.

Table 12 shows the 10 states that produce the largest share of certificates with significant economic value. Many of these states are in the Midwest and West. These states include: North Dakota, Montana, South Dakota, Idaho, Nebraska, Iowa, and Wyoming.

Wyoming produces a large quantity of certificates (ranked eighth), has a large share of workers with certificates (ranked second) and produces a large share of certificates with economic value (ranked eighth).

Table 13 shows the 10 states that produce the smallest share of certificates with economic value. These states are spread throughout the country. While Louisiana, Kentucky, and Georgia produce specialized certificates, ranking high among states in terms of production, this has not translated into high wages for their workers with certificates. However, this could

27. The next metric to compare states is based on the distribution of certificates produced. As illustrated in Part 2, the wage returns to certificates vary widely depending on field of study. The methodology developed is designed to identify certificate fields of study and program length that would have high labor market value.

Table 12. Some states produce a large share with significant payoffs.

| Top 10 States by Share of Certificates with Economic Value | |
|--|---|
| State | Share of Certificates with Economic Value |
| North Dakota | 65.2% |
| Montana | 65.1% |
| Rhode Island | 65.1% |
| South Dakota | 63.9% |
| Idaho | 63.5% |
| Nebraska | 60.9% |
| Iowa | 59.7% |
| Wyoming | 59.5% |
| Connecticut | 57.4% |
| West Virginia | 57.1% |

Source: Integrated Postsecondary Education Data System (IPEDS) 2010; Survey of Income and Program Participation. For a complete explanation of the methodology used, please see Appendix J.

Table 13. Some states produce a low share of certificates with significant payoffs.

| Bottom 10 States by Share of Certificates with Economic Value | |
|---|---|
| State | Share of Certificates with Economic Value |
| South Carolina | 37.5% |
| Colorado | 39.3% |
| New Hampshire | 40.9% |
| Louisiana | 40.9% |
| Illinois | 41.5% |
| Kentucky | 42.1% |
| Washington | 43.0% |
| Georgia | 43.1% |
| Michigan | 43.3% |
| California | 43.7% |

Source: Integrated Postsecondary Education Data System (IPEDS) 2010; Survey of Income and Program Participation. For a complete explanation of the methodology used, please see Appendix J.

be a sign of low wages within the region.

Conclusion

In an American economy where the advancement of technology and globalization means that a high school diploma alone is no longer able to provide family-sustaining earnings to many, certificates represent one piece of a multi-pronged solution on the road to a workforce with 60 percent postsecondary attainment. Though certificates currently aren't counted in many measures of postsecondary attainment, often they provide the outcomes that degree-seeking students are looking for: gainful employment. Certificates can also serve as the first rung on the ladder to a college degree or as training for workers with degrees who are engaged in the process of lifelong learning and career advancement. The rapid growth of certificates over the past 30 years is a promising signal that students and institutions are recognizing the value of certificates at an increasing rate.

The main lesson from the available data on certificates is this: They are diverse. While it is important to look at the value of certificates in the aggregate, their diversity in purpose and value means that transparency is absolutely essential. By and large, certificates work, but they do not work for everyone. The new federal gainful employment regulations are a good first step to ensuring that policymakers, institutions, and students are making informed choices when it comes to certificate programs.

Going forward, it will be important for all stakeholders to take note of these lessons:

- **Certificates vary in:**
 - **Purpose.** They can serve as: occupational training for high school graduates looking to enter a field or industry or for workers looking to enter a new field; preparation for a certification or license; a stepping stone to a college degree; and as post-degree training for experienced workers looking to learn a necessary skill.

- **Time.** Programs range from a semester of instructional time to four years.
- **Earnings.** Workers with certificates' pay ranges from as little as \$17,000 to as much as \$65,000.
- **Population.** Enrollees in certificate programs are spread across all socioeconomic, racial/ethnic and both sexes. Men and women enroll in certificate programs in similar numbers.
- **Certificates especially benefit those with less formal academic preparation.** In terms of academic preparation/skill, certificate holders closely resemble high school students and have lower test scores than workers with Associate's degrees and those with some college but no degree. However, the fact their earnings are slightly higher than workers with some college indicates that certificate holders gain occupational skills that close the earnings gap that arises from differences in academic preparation/skill.
- **If low-income students of average to high academic preparation/skill completed certificate programs, it would add significantly to postsecondary completions.** Among those who don't enroll in college degree programs, students from low-income families earn certificates at a lower rate than those from high-income families, even after controlling for academic preparation/skill. These students represent low hanging fruit in achieving the goal of 60 percent postsecondary completion, especially considering the low threshold of academic preparation/skill required to complete many certificate programs.
- **Working in the field of the certificate is essential for maximizing earnings.** Because certificate programs are usually short-term and focus on occupational rather than general skills, working in field is necessary for leveraging a certificate into higher earnings. Those who work in field receive a 37 percent wage premium, while those who work outside their field receive nearly the same wages as high school-educated workers.
- **Like college degrees, what you make depends on what you take.** In the new paradigm in higher education, it's not the credential that counts, but what is studied. This is true for certificates, too. A certificate holder in the highest-paying field, aviation, makes four times as much in annual salary as the lowest-paid field, food service.
- **Men who earn certificates get more bang for their buck.** Men get a 27 percent earnings boost on average, while women receive a 16 percent increase. Men make more, partly, because they work in higher paid fields, though this does not explain the whole earnings sex gap. With some exceptions, women typically need to pursue a college degree to gain access to middle-class earnings.
- **Hispanics who earn certificates get the biggest boost, whites get the most money, and African-Americans get the lowest earnings and the smallest boost.** Because high school-educated Hispanics' wages are very low, they get a big boost from certificates. For this reason, certificates are crucial for increasing wages among Hispanics. Conversely, because white high school graduates do relatively well—particularly white men—they only receive a 20 percent earnings increase. Despite the fact that African-Americans earn the largest share of certificates, they receive both the smallest premium and the lowest wages.
- **What you pay to earn a certificate depends on where you go to school.** Cost of attending differs dramatically across institutions. Public institutions' net cost is roughly one-third the cost at for-profit institutions.
- **States use certificates in different ways.** Because of differences in state economies, labor markets and institutional makeup, states vary in their production of certificates, share of workers with certificates, and the extent that certificates provide a valuable return. Some states may benefit from workers with certificates who are trained elsewhere, but migrate

to the state because of local labor market conditions. States that rank high in academic degree production tend to be different from those that produce a large share of certificates. Certificates are most prevalent in the Southern and Western regions of the country.

Because of the importance of working in field, certificate programs that incorporate job placement initiatives may be able to help their students maximize the return on their investments. Some institutions, like the Tennessee Technology Centers, are leading the way on this front by working with businesses and organizations in their local communities, often times ensuring their students are set up for gainful employment before they graduate. If institutions can themselves address the varied outcomes of certificate graduates, everyone wins: institutions, policymakers, and students preparing for tomorrow's economy.

Today, policymakers do have a role: to ensure that all parties involved know, to the greatest extent possible, that the value of the programs they are funding are transparent for all to see. Certificate programs are successful if they promote either: (1) gainful employment and long-term job and income security or (2) the pursuit of a higher level credential, typically a college degree. If they are successful in these two areas, certificate programs will ensure that students considering them will be able to make informed choices about what to study and where to study it, with reasonable expectations about their prospects after graduation.

Appendix A: DATA SOURCES

The National Longitudinal Study of Youth (NLSY), 1997 cohort, and the combined 2004 and 2008 panels of the Survey of Income and Program Participation (SIPP) form the basis of this report. The SIPP covers a representative cross section of the entire population. The NLSY follows individuals from 1997 through 2007 who were between the ages of 12 and 16 as of Dec. 31, 1996. The NLSY has detailed information on the background of young workers, while the combined SIPP panels have data on the entire workforce. Consequently, the SIPP data allow examination of how prevalent certificate attainment is among older workers.²⁸ In both cases, we can compare earnings of certificate holders with earnings of other groups among young and old workers.

NLSY

The NLSY is a longitudinal panel study administered by the U.S. Department of Education that consists of a representative sample of 12- to 16-year-olds as of Dec. 31, 1996. The NLSY collected detailed information on education, work, and training on an annual basis from every respondent through 2007 (the last available information). Because not everyone remained in the sample through 2007, we use the 2007 weight in reporting all of the analyses. NLSY is administered by the Department of Education.

Earnings data are based on the prior year; thus, the 2007 question reports earnings for 2006 when the respondents were 22 to 26 years old. By 2007, most of the survey respondents had completed their education and had a few years of labor market experience.

Although the administrators of the survey have generated a summary variable on certificate holding, it is defined broadly to include licenses, company training, and non-workplace awards (e.g., Red Cross first aid, camp horsemanship, and charm school certificates). Therefore, this report's definition of certificate holding is based on a compilation of several questions. The first one is: "Other than the regular schooling ... have you ever attended any schooling, courses or training programs designed to help people find a job, improve their job skills, or learn a new job?" After a series of detailed questions about five different training experiences, there are summary questions:

- (1) Did you get a certificate, license or degree from this training?
- (2) What type of school or training program was it?

28. The two data sources have slightly different questions that are particularly relevant to this study. While both ask separate questions about certificate-holding and educational attainment, the SIPP has questions about field of study for certificate holders and Associate's, Bachelor's, and graduate degree holders. The NLSY, by contrast, has questions about parental education, family income when the respondent was 12- to 16-years-old, and a basic skills measure.

These follow-up questions allowed exclusion of licenses, GEDs, company training, apprenticeship programs, and correspondence courses.

In addition, from 1997 to 2003 the NLSY included a question about the type of certificate earned. However, since most of these respondents earned their certificates after 2003 and one-third of the answers were “undefined,” it was not possible to present data on type of certificate and whether a person was working in their field of study.

In the education series of questions, respondents are asked: “What diploma, degree, or certificate have you received from this school?” Very few respondents answered this question that they had a “vocational or technical certificate.”

The NLSY also measures math and English skills. These skills measures are important, as they can be an indicator of likely labor market success. Since a larger proportion of skilled young people pursue college degrees, some of the employment and earnings returns to college may be simply a reflection of the higher skills the student initially possessed rather than the skills gained as a result of the educational process. Therefore, having a skills measure can lead to a more accurate measure of returns to educational attainment independent of skills.

SIPP

The purpose of the SIPP series of surveys is to collect up-to-date longitudinal information on income, labor force participation, government program participation, and general demographic information to assess the effectiveness of government programs and generally assess trends in income in the country. The U.S. Census Bureau administers the SIPP.

Each SIPP panel runs from 32 months to 48 months with questions being asked every four months about each of the preceding months. Each of the first eight waves has a variety of topical modules on training, personal history, child care, wealth, program eligibility, child support, utilization and cost of health care, disability, school enrollment, taxes, and annual income. The most detailed questions on certificates and fields of study were part of the training module given in the second wave of the survey.²⁹

Using workers between the ages of 23 and 64, this report examines how educational attainment is associated with different earnings levels. The most recent SIPP surveys began in September 2004 and May 2008, consisting of over 80,000 participants each.

Every month when information is collected, participants are questioned concerning employment, earnings, household status, income, health insurance, educational enrollment, and participation in government programs. In the second survey collection (covering months five to eight), a special supplemental module on training has detailed questions on certificate holding.

29. The relevant questions about certificate holding are: EVOCAT (“Did you attend a vocational, technical, trade or business school?”), RCOLLVOC (which is a constructed variable that shows the combination of certificate and educational attainment), and EVOCFLD (the type of certificate).

Previous Research on Sub-Baccalaureate Education

Previous research has found that sub-baccalaureate education, including certificates, yields positive economic returns. The first papers were written in the 1990s, and include Grubb (1993, 1995), Kane and Rouse (1995), and Kerckhoff and Bell (1998). Further research has used successive panels of the Survey of Income and Program Participation (SIPP) and various surveys tracking the experiences of youth from high school to young adulthood. The results have been fairly consistent in finding that certificate holders earn 15 percent to 25 percent more than comparable workers with only a high school diploma and no postsecondary education (see for example, Ryan (2005), Grubb (2002), and Bailey, Kienzl and Marcotte (2004)). Finally, Lerman and Holzer (2007) argue that approximately half of all new jobs will be middle-skill jobs, ensuring that the demand for graduates from well-tailored certificate programs will be strong.

Appendix B:

REGRESSION ANALYSES OF EARNINGS (SIPP AND NLSY)

The previous tables demonstrate the difference in earnings between certificate holders and workers with a high school diploma but no postsecondary education. However, in isolated cases, this approach is not accurate because of unusual factors. For this reason, researchers have refined a more robust method for determining earnings differences by education level: multivariate regression analysis. To demonstrate that the results presented above are accurate and not influenced by any unusual factors, these are the results using regression analysis. These results are nearly identical to the other data presented in the text.

The standard approach is to use the log of earnings and adjust for demographic differences, experience, and indicators of educational attainment: a series of zero or one “dummy” variables. The coefficients presented in regressions represent differences from the omitted variable. For example, in regressions with all workers, the variable “female” shows how much less women make than men after adjusting for educational attainment and age. In a similar fashion, the race/ethnicity variables represent the difference from white workers. Finally, the comparison group for the education variables is those with a high school diploma and no postsecondary education.

Regression analysis also differs from comparisons based on tabular results because there is a test of “statistical significance” of how accurate the estimated effect is. In general, researchers say that a result is statistically significant if the probability value that the coefficient is different from zero at the 95 percent level of accuracy. Consequently, in all of the tables presented below, this probability factor is included and these results are very robust because in most cases this probability is greater than 99.9 percent—the “ <0.001 ” in the tables.

Table A1 presents the results of the simple regressions for all workers and for male and female workers separately. Regressions were computed separately for men and women because of the finding that the earnings premium for certificates was less for women than men, which was validated by the regression analysis. In the regression using all workers, the -0.489 on the second line means that, all other things being equal, woman workers earn 48.9 percent less than their male counterparts. This is a composite number, averaging out the differences at each of the educational levels. By comparison, the earnings gap is smaller, but still quite large, for minorities. African-Americans’ earnings are 17.8 percent lower than whites, Latinos’ earnings are 13.5 percent lower than whites, and Asians and other races see earnings differences 13.2 percent lower than whites.

Table A1: Regression analyses, SIPP 2004/2008

| Variable | All workers | | Male workers | | Female workers | |
|--------------------|--------------|------------------|--------------|------------------|----------------|------------------|
| | Coefficient | Probability | Coefficient | Probability | Coefficient | Probability |
| Female | -0.489 | <.0001 | | | | |
| Experience | 0.038 | <.0001 | 0.051 | <.0001 | 0.027 | <.0001 |
| Experience Squared | -0.001 | <.0001 | -0.001 | <.0001 | 0.000 | <.0001 |
| African-American | -0.178 | <.0001 | -0.345 | <.0001 | -0.041 | 0.0248 |
| Hispanic | -0.135 | <.0001 | -0.172 | <.0001 | -0.094 | <.0001 |
| Other Race | -0.132 | <.0001 | -0.211 | <.0001 | -0.046 | 0.0501 |
| HS dropout | -0.388 | <.0001 | -0.306 | <.0001 | -0.499 | <.0001 |
| Certificate | 0.187 | <.0001 | 0.217 | <.0001 | 0.149 | <.0001 |
| Some College | 0.201 | <.0001 | 0.219 | <.0001 | 0.185 | <.0001 |
| AA Degree | 0.471 | <.0001 | 0.430 | <.0001 | 0.503 | <.0001 |
| BA Degree | 0.717 | <.0001 | 0.732 | <.0001 | 0.700 | <.0001 |
| Graduate Degree | 1.128 | <.0001 | 1.111 | <.0001 | 1.143 | <.0001 |

These are five separate education level variables; the coefficients on these variables should be interpreted as percentage difference from those with just a high school diploma. For example, the coefficient of -0.388 in column 2 for high school dropouts means that workers without a high school diploma earn 39 percent less than those with a high school diploma and no further education averaged across all ages, sexes, and races. The certificate coefficient of 18.7 percent is nearly identical to the one presented in the full report.

The education coefficients differ between men and women. At the bottom end of the skill level, women high school dropouts earn 50 percent less than women with a high school diploma while the comparable male difference is 31 percent. For those with certificates as their highest education level, women earn 15 percent more than women with a high school diploma versus a male certificate premium of 22 percent. At the some college level, women continue to have a small premium over high school compared with men. But this pattern changes for women with college degrees. For example, the Associate's degree premium over high school is 50 percent for women versus 43 percent for men. At the four-year and graduate levels, the earnings advantage is about comparable for men and women.

Table A2 presents the same information with the inclusion of the indicator for an occupation in the same field as a worker's field of study. Interestingly, the in-field premium is larger for women (41.4 percent) than it is for men (32.3 percent). Under all circumstances, the in-field earnings premium is very large, meaning that the educational coefficients now represent the earnings premium of those not in-field over high school educated workers.

For certificate holders, a large in-field premium means that those working outside their field of study are not utilizing the skills they learned in their certificate program. Instead, they rely on the general skills and opportunities open to them. Here, the sex gap is even greater: While male certificate holders earn nearly 13 percent more than comparable male high school graduates, the earnings premium for women working outside their field of study disappears (0.7 percent, but not statistically significant).

Table A2: Regression analyses with in-field variable, SIPP 2004/2008

| Variable | All workers | | Male workers | | Female workers | |
|--------------------|--------------|------------------|--------------|------------------|----------------|---------------|
| | Coefficient | Probability | Coefficient | Probability | Coefficient | Probability |
| Female | -0.499 | <.0001 | | | | |
| Experience | 0.039 | <.0001 | 0.052 | <.0001 | 0.028 | <.0001 |
| Experience Squared | -0.001 | <.0001 | -0.001 | <.0001 | 0.000 | <.0001 |
| African-American | -0.174 | <.0001 | -0.338 | <.0001 | -0.040 | 0.0268 |
| Hispanic | -0.128 | <.0001 | -0.163 | <.0001 | -0.092 | <.0001 |
| Other Race | -0.129 | <.0001 | -0.208 | <.0001 | -0.042 | 0.0711 |
| HS dropout | -0.391 | <.0001 | -0.309 | <.0001 | -0.500 | <.0001 |
| Certificate | 0.073 | <.0001 | 0.128 | <.0001 | 0.007 | 0.7651 |
| Some College | 0.203 | <.0001 | 0.220 | <.0001 | 0.186 | <.0001 |
| AA Degree | 0.350 | <.0001 | 0.337 | <.0001 | 0.354 | <.0001 |
| BA Degree | 0.580 | <.0001 | 0.620 | <.0001 | 0.537 | <.0001 |
| Graduate Degree | 0.934 | <.0001 | 0.949 | <.0001 | 0.917 | <.0001 |
| Work Infield | 0.373 | <.0001 | 0.323 | <.0001 | 0.414 | <.0001 |

In the NLSY data, the labor force experience of young people runs the gamut from having after-school and summer jobs while in high school to part-time jobs while in college to full-time employment after completing formal education. Knowing the labor force history of survey respondents is important to ensure measurement of the earnings effects of education separate from the effects of experience. In the regression analysis discussed above using SIPP data, ‘potential experience’ is defined as the number of years since one’s last year of school (based on the normal age of ending school). In other words, if a person is 35 years old and has a Bachelor’s degree, her potential experience is 13 years because the normal age that one receives a Bachelor’s is 22. It does not matter whether she got her Bachelor’s at 21 or 31; her potential experience is defined as 13 years.³⁰ The potential experience approach disregards any returns from working before getting one’s highest education degree.

However, the NLSY data contains young respondents’ actual work experience during the years before and after they have finished their education.³¹ Table A3 presents three regression results. The simple regression only includes demographic and education levels plus a variable indicating whether someone was enrolled in college in the final year. Not surprisingly, being enrolled is a negative factor (-27% in the simple regression) because these individuals cannot devote all of their energies to work.

In the simple regression, the earnings of women and African-Americans are less than comparable whites by 32 percent and 24 percent, respectively. The earnings of Latinos and those of other races, on the hand, are not significantly different from whites once adjustments are

30. Most socioeconomic surveys do not include data on age at completion of education, nor do they have complete work histories.

31. It is not clear how to measure experience among very young people. For example, does working while in school in jobs not related to your field or skills count the same as working after obtaining a degree? Further, for high school graduates or dropouts, should the experience working at 17, 18, and 19 while living with one’s parents be considered as equivalent experience as working at 23 to 27? In order to take full advantage of the information available, one year of experience was added for every year a person worked more than 1,750 hours; if a person worked between 875 and 1,749 hours, a half-year of experience was added. Finally, all working experiences before age 18 were reduced by 50 percent to reflect the fact that these were probably low skill, after-school jobs.

made for educational attainment. Certificate holders get a 30 percent premium over high school workers; this is significantly higher than the bump found in the SIPP data and reflects the fact that getting a certificate is a very good start to one's career. In the NLSY, there is no difference between men and women in the size of this bump).

Table A3: Earnings Returns to Certificates, NLSY Data

| | Simple Regression | | Add Skill Measure | | Add Experience | |
|---------------------|-------------------|------------------|-------------------|------------------|----------------|------------------|
| | Coefficient | Probability | Coefficient | Probability | Coefficient | Probability |
| Female | -0.32 | <.0001 | -0.32 | <.0001 | -0.30 | <.0001 |
| Experience | | | | | 0.26 | <.0001 |
| Experience Squared | | | | | -0.01 | <.0001 |
| African-American | -0.24 | <.0001 | -0.15 | <.0001 | -0.06 | 0.0626 |
| Hispanic | -0.01 | 0.8509 | 0.06 | 0.1075 | 0.07 | 0.0254 |
| Other Race | -0.07 | 0.2839 | -0.05 | 0.4384 | 0.07 | 0.2584 |
| HS dropout | -0.34 | <.0001 | -0.30 | <.0001 | -0.19 | 0.0013 |
| Certificate | 0.30 | <.0001 | 0.26 | <.0001 | 0.33 | <.0001 |
| Some College | 0.24 | <.0001 | 0.17 | <.0001 | 0.17 | <.0001 |
| AA Degree | 0.46 | <.0001 | 0.39 | <.0001 | 0.39 | <.0001 |
| BA Degree | 0.67 | <.0001 | 0.52 | <.0001 | 0.67 | <.0001 |
| Enrolled in 2009 | -0.27 | <.0001 | -0.29 | <.0001 | -0.17 | <.0001 |
| ASVAB skill measure | | | 0.04 | <.0001 | 0.04 | <.0001 |

The second regression adds the ASVAB ability measure to account for the fact that more skilled people go to college. By adding this variable, the effect of more education can be separated from differences in ability levels. As can be seen, all of the coefficients on the higher education variables go down significantly; for certificate holders, the premium over high school only is now 26 percent.

The final equation adds experience to the mix to account for the fact that high school only workers have had more time to find their best job match and to gain relevant seniority. The experience coefficient is very high (26 percent more for each additional year of experience) because this is a time of great labor market change, as young workers change jobs often. Since high school only workers have more experience, the educational effect is now larger (33 percent for certificate holders).

Appendix C:

INDIVIDUAL STATE AND COMMUNITY COLLEGE CERTIFICATE REPORTS

While relatively little national data have been produced that examines the value of certificates, many individual states and institutions have conducted or commissioned their own studies. The findings of these reports differ to some extent partially based on differences in methodology. For example, some reports calculated certificate holders earnings immediately after graduation, while others used their career midpoint.

Most of the reports reinforce the findings presented in this report—a large wage premium to certificates—though some do not. One report based in Kentucky, for example, found no return at all for women and a minimal return for men. Indeed, we find that returns to certificates vary greatly from state to state, and would expect them to vary across institutions as well.

Some of these reports also examined the value of differences based on program length. A report conducted in Colorado found a significant difference in the returns between certificates of a year or less (only a 3% wage premium) and those greater than a year (a 30% wage premium). Other reports conducted in Florida and Illinois found significant returns for both short- and medium-term certificates.

| State | Year | Institution | Program Length | Wage Premium (\$) | Wage Premium (%) | Time of Measurement | Source |
|-------------|------|--------------------------------|--------------------|-------------------|------------------|-----------------------------|-------------------------------------|
| California | 2006 | Contra Costa Community College | - | 6,600 | 16 | Career Midpoint | CCBenefits, Inc. |
| Colorado | 2010 | Colorado Community Colleges | 1 year | 328 | 1.8 | Immediately upon graduation | Colorado Community College System |
| Colorado | 2010 | Colorado Community Colleges | 2 year | 4,685 | 29.6 | Immediately upon graduation | Colorado Community College System |
| Connecticut | 2008 | Connecticut Community Colleges | - | 8,000 | 19 | Career midpoint | Economic Modeling Specialists, Inc. |
| Florida | 2011 | Florida College System | PAVC ³² | 16,396 | 78 | - | The Florida College System |
| Florida | 2011 | Florida College System | PVC ³³ | 18,148 | 86 | - | The Florida College System |

32. Postsecondary Adult Vocational Certificate
33. Postsecondary Vocational Certificate

| State | Year | Institution | Program Length | Wage Premium (\$) | Wage Premium (%) | Time of Measurement | Source |
|------------|------|---|---------------------------|-------------------|------------------|-----------------------------|---|
| Illinois | 2005 | Illinois Community Colleges | Less than 30 credit hours | 250/credit hour | - | Immediately upon graduation | Center for Governmental Studies at Northern Illinois University |
| Illinois | 2005 | Illinois Community Colleges | More than 30 credit hours | 175/credit hour | - | Immediately upon graduation | Center for Governmental Studies at Northern Illinois University |
| Illinois | 2007 | Joliet Junior College | Less than 30 credit hours | 8,436 | - | Immediately upon graduation | Center for Governmental Studies at Northern Illinois University |
| Illinois | 2007 | Joliet Junior College | More than 30 credit hours | 11,094 | - | Immediately upon graduation | Center for Governmental Studies at Northern Illinois University |
| Maryland | 2007 | Maryland Community Colleges | - | 5,900 | 17 | Career midpoint | CCbenefits, Inc. |
| Michigan | 2010 | Glen Oaks Community College | | 4,000 | 17 | Career midpoint | CCbenefits, Inc. |
| Nebraska | 2009 | Mid Plains Community College | | 3,500 | 16 | Career midpoint | Economic Modeling Specialists, Inc. |
| Nevada | 2007 | Community College of Southern Nevada | | 5,200 | 16 | Career midpoint | CCbenefits, Inc. |
| New York | 2008 | Schenectady Community College | | 6,300 | 16 | Career midpoint | Economic Modeling Specialists, Inc. |
| Ohio | 2010 | Columbus State Community College | | 5,700 | 16 | Career midpoint | Economic Modeling Specialists, Inc. |
| Oregon | 2006 | Oregon Community Colleges | 1 year | 4,820 | 16 | Career midpoint | CCbenefits, Inc. |
| Texas | 2010 | Texas Community Colleges | | 3,400 | 16 | Career midpoint | CCbenefits, Inc. |
| Washington | 2006 | Washington (state) Community and Technical Colleges | 1 year | 4,214 | 16 | Career midpoint | CCbenefits, Inc. |

Appendix D:

OCCUPATIONS BY CERTIFICATE REQUIREMENT (O*NET)

The following appendix contains a list of occupations based on data from the Occupational Information Network (O*NET), developed by the Employment and Training Administration division of the Department of Labor to provide educational requirements of each occupation in the economy on the basis of detailed information about the mix of knowledge, skills, and abilities of each job. A survey of incumbent workers in each occupation asked, "What is the highest level of educational attainment needed to perform the tasks of the job?" The table below provides a list of occupations where survey respondents said certificates was the highest educational requirement.

The table is limited to those with greater than 10,000 survey respondents where at least 20 percent of respondents said a certificate is the lowest level of education required.

| Occupation | Number of Respondents | Share That Report Certificate as Lowest Education Required |
|---|-----------------------|--|
| Bus and truck mechanics and diesel engine specialists | 222,143 | 80.2% |
| Skin care specialists | 29,638 | 74.1% |
| Barbers, hairdressers, hairstylists, and cosmetologists | 321,667 | 72.9% |
| Shampooers | 15,117 | 67.6% |
| Sound engineering technicians | 11,002 | 66.7% |
| Mobile heavy equipment mechanics, except engines | 94,785 | 65.5% |
| Boat and cycle mechanics | 30,682 | 63.5% |
| Electronic equipment installers and repairers, motor vehicles | 76,364 | 56.6% |
| Massage therapists | 38,340 | 56.6% |
| Dental assistants | 212,913 | 55.9% |
| Aircraft mechanics and service technicians | 72,952 | 55.2% |
| Tool and die makers | 45,463 | 54.5% |
| Cement masons and concrete finishers | 110,682 | 52.8% |
| Telecommunications equipment installers and repairers, except line installers | 101,485 | 50.9% |
| Crane and tower operators | 22,539 | 48.6% |
| Automotive service technicians and mechanics | 357,863 | 48.0% |
| Operating engineers and other construction equipment operators | 209,126 | 47.9% |
| Electricians | 317,093 | 47.5% |
| Nursing aides, orderlies, and attendants | 782,503 | 46.0% |
| Helpers—Installation, maintenance, and repair workers | 74,234 | 45.1% |

| Occupation | Number of Respondents | Share That Report Certificate as Lowest Education Required |
|---|-----------------------|--|
| Sales representatives, services, all other | 339,603 | 45.0% |
| Travel agents | 42,420 | 45.0% |
| Carpenters | 501,674 | 44.8% |
| Electrical and electronics installers and repairers, transportation equipment | 25,237 | 44.2% |
| Surgical technologists | 48,634 | 43.8% |
| Manicurists and pedicurists | 30,039 | 42.9% |
| Power and Medical equipment repairers | 56,071 | 42.7% |
| Property, real estate, and community association managers | 221,244 | 42.0% |
| Emergency medical technicians and paramedics | 101,563 | 41.1% |
| Control and valve installers and repairers, except mechanical door | 19,241 | 40.2% |
| Real estate sales agents | 303,306 | 40.1% |
| Opticians, dispensing | 29,198 | 39.7% |
| Electric motor, power tool, and related repairers | 8,779 | 39.5% |
| Cutters and trimmers, hand | 10,210 | 38.3% |
| Sheet metal workers | 63,022 | 37.5% |
| Industrial machinery mechanics | 112,361 | 36.7% |
| Administrative services managers | 99,066 | 36.6% |
| Construction helpers | 71,651 | 35.0% |
| Drilling, milling, turning, and boring machine tool setters, operators, and tenders | 41,576 | 34.4% |
| Millwrights | 17,226 | 33.4% |
| Network systems and data communications analysts | 122,187 | 33.1% |
| Electrical and electronics repairers, commercial and industrial equipment | 28,006 | 32.5% |
| Electro-mechanical technicians | 5,737 | 32.5% |
| Computer-controlled machine tool operators, metal and plastic | 45,415 | 32.0% |
| Maintenance and repair workers, general | 462,111 | 31.9% |
| Computer systems analysts | 198,616 | 31.9% |
| Aircraft structure, surfaces, rigging, and systems assemblers | 12,260 | 31.8% |
| First-line supervisors/managers of mechanics, installers, and repairers | 147,156 | 31.3% |
| Directors, religious activities and education, religious workers | 21,897 | 31.3% |
| Heating, air conditioning, and refrigeration mechanics and installers | 90,407 | 31.2% |
| Construction and related workers, all other | 16,836 | 30.9% |
| Licensed practical and licensed vocational nurses | 253,615 | 30.7% |
| Automotive glass installers, body and related repairers | 56,513 | 30.5% |
| Electrical, electronic, and engine equipment assemblers | 73,238 | 30.1% |
| Audio, video equipment, broadcast technicians and radio operators | 17,969 | 29.8% |
| Sailors, captains, ship engineers, and mates | 55,360 | 29.8% |
| First-line supervisors/managers of housekeeping and janitorial workers | 79,630 | 29.6% |
| Fire fighters, fire inspectors and investigators | 104,077 | 29.4% |
| Medical and clinical laboratory technicians | 51,358 | 29.3% |
| Machinists | 117,755 | 29.1% |
| Medical transcriptionists | 29,871 | 28.8% |
| Cooks and food servers, private household, nonrestaurant | 63,791 | 28.8% |

| Occupation | Number of Respondents | Share That Report Certificate as Lowest Education Required |
|--|-----------------------|--|
| Appraisers and assessors of real estate | 55,022 | 28.2% |
| Insurance underwriters | 28,889 | 27.9% |
| Curators and Library technicians | 39,887 | 27.5% |
| Extruding and drawing machine setters, operators, and tenders, metal and plastic | 24,138 | 27.3% |
| Procurement clerks | 21,217 | 27.2% |
| Welders, cutters, solderers, and brazers | 111,523 | 26.6% |
| Radiologic technologists and technicians | 63,130 | 26.5% |
| Pharmacy and respiratory therapy technicians | 140,251 | 26.4% |
| Respiratory therapists | 34,005 | 26.4% |
| Hazardous materials removal workers | 11,246 | 26.2% |
| Upholsterers and other textile workers | 22,942 | 25.8% |
| Maintenance workers, machinery | 20,655 | 25.5% |
| Transportation, storage, and distribution managers | 26,773 | 25.5% |
| Civil engineering technicians | 24,119 | 25.4% |
| First-line supervisors/managers of fire fighting and prevention workers | 16,532 | 24.5% |
| Industrial production managers | 35,458 | 23.7% |
| Excavating and loading machine and dragline operators | 16,731 | 23.7% |
| Diagnostic medical sonographers | 13,864 | 23.4% |
| Private detectives and investigators | 13,209 | 22.9% |
| Stationary engineers and boiler operators | 10,248 | 22.9% |
| Medical assistants | 141,612 | 22.9% |
| Inspectors, testers, sorters, samplers, and weighers | 96,806 | 22.3% |
| Interior designers | 15,947 | 22.0% |
| Multiple machine tool setters, operators, and tenders, metal and plastic | 19,724 | 21.8% |
| Truck drivers, heavy and tractor-trailer | 399,759 | 21.7% |
| Surveying and mapping technicians | 18,333 | 21.4% |
| Plumbers, pipefitters, and steamfitters | 98,326 | 21.0% |
| Medical secretaries | 110,377 | 20.6% |
| First-line supervisors/managers of production and operating workers | 135,117 | 20.6% |
| Farmers and ranchers | 91,733 | 19.3% |

Appendix E:

OCCUPATIONS WITH HIGH CONCENTRATIONS OF WORKERS WITH CERTIFICATES (SIPP)

The table below provides a list of occupations ordered by the share of workers that have a certificate and are employed in the occupations, based on the Survey of Income and Program Participation (SIPP). This table shows the occupations where certificate-holders are most heavily concentrated.

| Field of Occupation | Occupation | Share of Workers Employed in Occupation with a Certificate |
|--------------------------|--|--|
| Agriculture/ Forestry | Miscellaneous agricultural workers | 7.9% |
| | First-line supervisors/managers of retail sales workers | 4.2% |
| | Operating engineers and other construction equipment operators | 4.1% |
| | Inspectors, testers, sorters, samplers, and weighers | 2.7% |
| | First-line supervisors/managers of production and operating workers | 2.6% |
| | Pest control workers | 1.9% |
| | First-line supervisors/managers of landscaping, lawn service, and groundskeeping workers | 1.6% |
| | Farmers and ranchers | 1.4% |
| Auto mechanics | Automotive service technicians and mechanics | 14.3% |
| | Driver/sales workers and truck drivers | 9.2% |
| | Bus and truck mechanics and diesel engine specialists | 4.7% |
| | Inspectors, testers, sorters, samplers, and weighers | 2.1% |
| | Heavy vehicle and mobile equipment service technicians and mechanics | 2.0% |
| | Industrial and refractory machinery mechanics | 1.9% |
| | Automotive body and related repairers | 1.8% |
| | Maintenance and repair workers, general | 1.7% |
| | Miscellaneous assemblers and fabricators | 1.4% |
| | First-line supervisors/managers of mechanics, installers, and repairers | 1.3% |
| | General and operations managers | 1.2% |

| Field of Occupation | Occupation | Share of Workers Employed in Occupation with a Certificate |
|---|---|---|
| Aviation | Aircraft mechanics and service technicians | 20.8% |
| | Bus and truck mechanics and diesel engine specialists | 4.4% |
| | First-line supervisors/managers of mechanics, installers, and repairers | 2.8% |
| | Aircraft pilots and flight engineers | 2.4% |
| | Inspectors, testers, sorters, samplers, and weighers | 2.3% |
| | Air traffic controllers and airfield operations specialists | 1.8% |
| | First-line supervisors/managers of construction trades and extraction workers | 1.5% |
| | Aerospace engineers | 1.5% |
| | Other installation, maintenance, and repair workers | 1.5% |
| | Transportation inspectors | 1.4% |
| | Industrial and refractory machinery mechanics | 1.4% |
| | Other teachers and instructors | 1.2% |
| | Painting workers | 0.9% |
| | Printing machine operators | 0.8% |
| | Operating engineers and other construction equipment operators | 0.8% |
| | First-line supervisors/managers of office and administrative support workers | 0.8% |
| | Avionics technicians | 0.7% |
| | Managers, all other | 0.6% |
| Business/ Office Management | Secretaries and administrative assistants | 9.5% |
| | Bookkeeping, accounting, and auditing clerks | 4.0% |
| | First-line supervisors/managers of office and administrative support workers | 3.6% |
| | Receptionists and information clerks | 2.7% |
| | Customer service representatives | 2.6% |
| | Office clerks, general | 2.4% |
| | Retail salespersons | 2.3% |
| | First-line supervisors/managers of retail sales workers | 2.2% |
| | Managers, all other | 1.7% |
| | Cashiers | 1.6% |
| | Stock clerks and order fillers | 1.5% |
| | Financial managers | 1.4% |
| | Human resources, training, and labor relations specialists | 1.3% |
| | Data entry keyers | 1.2% |
| | Sales representatives, wholesale and manufacturing | 1.0% |
| Computer and Information Services | First-line supervisors/managers of office and administrative support workers | 2.4% |
| | Computer software engineers | 2.0% |
| | Computer, automated teller, and office machine repairers | 1.9% |
| | Computer scientists and systems analysts | 1.8% |
| | Network and computer systems administrators | 1.7% |
| | Computer and information systems managers | 1.5% |
| | Network systems and data communications analysts | 1.4% |
| | Computer programmers | 1.4% |
| | Managers, all other | 1.3% |
| | Computer support specialists | 1.3% |

| Field of Occupation | Occupation | Share of Workers Employed in Occupation with a Certificate |
|---------------------|--|--|
| Construction Trades | Carpenters | 8.0% |
| | Electricians | 5.8% |
| | Driver/sales workers and truck drivers | 5.3% |
| | First-line supervisors/managers of construction trades and extraction workers | 4.6% |
| | Pipelayers, plumbers, pipefitters, and steamfitters | 3.7% |
| | Construction laborers | 2.9% |
| | Welding, soldering, and brazing workers | 2.0% |
| | Construction managers | 1.7% |
| | Operating engineers and other construction equipment operators | 1.5% |
| | Brickmasons, blockmasons, and stonemasons | 1.3% |
| | First-line supervisors/managers of production and operating workers | 1.2% |
| | Miscellaneous assemblers and fabricators | 1.2% |
| | Radio and telecommunications equipment installers and repairers | 1.2% |
| | Electrical power-line installers and repairers | 1.0% |
| | General and operations managers | 1.0% |
| Cosmetology | Millwrights | 1.0% |
| | Hairdressers, hairstylists, and cosmetologists | 12.2% |
| | Retail salespersons | 3.2% |
| | Miscellaneous personal appearance workers | 2.9% |
| | Customer service representatives | 2.4% |
| Drafting | Other teachers and instructors | 0.8% |
| | Drafters | 11.6% |
| | Managers, all other | 3.9% |
| | Industrial and refractory machinery mechanics | 3.6% |
| | Designers | 3.3% |
| | Heating, air conditioning, and refrigeration mechanics and installers | 2.6% |
| | Inspectors, testers, sorters, samplers, and weighers | 2.5% |
| | Compliance officers, except agriculture, construction, health and safety, and transportation | 2.3% |
| | Pipelayers, plumbers, pipefitters, and steamfitters | 1.9% |
| | First-line supervisors/managers of office and administrative support workers | 1.8% |
| Electronics | Aerospace engineers | 1.6% |
| | Electricians | 14.3% |
| | Engineering technicians, except drafters | 4.4% |
| | Radio and telecommunications equipment installers and repairers | 3.8% |
| | Maintenance and repair workers, general | 2.6% |
| | Inspectors, testers, sorters, samplers, and weighers | 1.8% |
| | Heating, air conditioning, and refrigeration mechanics and installers | 1.6% |
| | Industrial and refractory machinery mechanics | 1.4% |
| | Telecommunications line installers and repairers | 1.4% |
| | Electric motor, power tool, and related repairers | 1.0% |

| Field of Occupation | Occupation | Share of Workers Employed in Occupation with a Certificate |
|---------------------|---|--|
| Food Service | Cooks | 11.1% |
| | Chefs and head cooks | 6.8% |
| | First-line supervisors/managers of food preparation and serving workers | 2.4% |
| | Food service managers | 2.3% |
| | First-line supervisors/managers of retail sales workers | 1.8% |
| | Miscellaneous agricultural workers | 1.8% |
| | Bartenders | 1.4% |
| | Food servers, nonrestaurant | 0.9% |
| | Dishwashers | 0.9% |
| Healthcare | Nursing, psychiatric, and home health aides | 14.7% |
| | Medical assistants and other healthcare support occupations | 6.5% |
| | Registered nurses | 6.0% |
| | Licensed practical and licensed vocational nurses | 4.9% |
| | Personal and home care aides | 3.5% |
| | Secretaries and administrative assistants | 3.1% |
| | Health diagnosing and treating practitioner support technicians | 1.9% |
| | Dental assistants | 1.9% |
| | Receptionists and information clerks | 1.5% |
| | Diagnostic related technologists and technicians | 1.3% |
| | Miscellaneous health technologists and technicians | 1.0% |
| Metalworking | Clinical laboratory technologists and technicians | 0.9% |
| | Welding, soldering, and brazing workers | 11.3% |
| | Machinists | 7.2% |
| | First-line supervisors/managers of production and operating workers | 2.7% |
| | Production workers, all other | 2.6% |
| | Pipelayers, plumbers, pipefitters, and steamfitters | 2.3% |
| | Inspectors, testers, sorters, samplers, and weighers | 2.2% |
| | Computer control programmers and operators | 2.1% |
| | Sheet metal workers | 2.0% |
| | Driver/sales workers and truck drivers | 1.9% |
| | Tool and die makers | 1.9% |
| | Structural iron and steel workers | 1.7% |
| | First-line supervisors/managers of construction trades and extraction workers | 1.7% |
| | Industrial and refractory machinery mechanics | 1.6% |
| | Operating engineers and other construction equipment operators | 1.4% |
| | Maintenance and repair workers, general | 1.3% |
| | Structural metal fabricators and fitters | 1.2% |

| Field of Occupation | Occupation | Share of Workers Employed in Occupation with a Certificate |
|---|---|--|
| Police/ Protective Services | Police and sheriff's patrol officers | 20.7% |
| | Security guards and gaming surveillance officers | 8.5% |
| | Bailiffs, correctional officers, and jailers | 6.1% |
| | Detectives and criminal investigators | 4.8% |
| | Fire fighters | 4.2% |
| | First-line supervisors/managers of police and detectives | 2.3% |
| | Social workers | 1.3% |
| | First-line supervisors/managers of correctional officers | 1.0% |
| | First-line supervisors/managers of office and administrative support workers | 0.8% |
| Refrigeration, Heating, or Air Conditioning | Heating, air conditioning, and refrigeration mechanics and installers | 17.2% |
| | Industrial and refractory machinery mechanics | 4.1% |
| | First-line supervisors/managers of construction trades and extraction workers | 3.9% |
| | Pipelayers, plumbers, pipefitters, and steamfitters | 3.8% |
| | Maintenance and repair workers, general | 3.6% |
| | Electricians | 1.9% |
| | Sales representatives, wholesale and manufacturing | 1.7% |
| | First-line supervisors/managers of mechanics, installers, and repairers | 1.6% |
| | Stationary engineers and boiler operators | 1.5% |
| | First-line supervisors/managers of retail sales workers | 1.5% |
| | Inspectors, testers, sorters, samplers, and weighers | 1.5% |
| | Driver/sales workers and truck drivers | 39.8% |
| Transportation and Materials Moving | Bus drivers | 3.1% |
| | Construction laborers | 1.6% |
| | Industrial truck and tractor operators | 1.5% |
| | Operating engineers and other construction equipment operators | 1.5% |
| | Laborers and freight, stock, and material movers, hand | 1.5% |
| | Miscellaneous assemblers and fabricators | 1.3% |
| | Electricians | 1.1% |
| | Sales representatives, wholesale and manufacturing | 1.1% |
| | Automotive service technicians and mechanics | 0.9% |
| | Ambulance drivers and attendants, except emergency medical technicians | 0.8% |

Appendix F:

STATES RANKED BY SHARE OF WORKERS WITH CERTIFICATES (SIPP)

The table below is based on data from the Survey of Income and Program Participation. The table shows states ordered by the share of workers in the state that report a certificate as their highest level of education.

| State | Share of Workers with a Certificate | State | Share of Workers with a Certificate |
|----------------------|-------------------------------------|----------------|-------------------------------------|
| Wyoming | 20.1% | Kansas | 10.2% |
| Oklahoma | 18.2% | Arizona | 10.1% |
| Louisiana | 14.9% | New Hampshire | 10.1% |
| Pennsylvania | 14.0% | Indiana | 10.0% |
| Nevada | 12.8% | Rhode Island | 9.9% |
| Minnesota | 12.7% | Maryland | 9.7% |
| Missouri | 12.6% | California | 9.7% |
| Maine | 12.3% | Massachusetts | 9.5% |
| Mississippi | 12.3% | Wisconsin | 9.4% |
| South Dakota | 12.3% | Delaware | 9.4% |
| Florida | 12.0% | Connecticut | 9.3% |
| Michigan | 11.7% | Georgia | 9.3% |
| Alaska | 11.6% | North Dakota | 9.1% |
| Arkansas | 11.4% | Iowa | 9.1% |
| Washington | 11.3% | Vermont | 9.0% |
| Idaho | 11.1% | Colorado | 8.9% |
| Montana | 11.0% | Hawaii | 8.9% |
| Ohio | 10.9% | Oregon | 8.5% |
| Tennessee | 10.8% | New Mexico | 8.5% |
| West Virginia | 10.7% | Alabama | 8.4% |
| New Jersey | 10.6% | New York | 8.2% |
| District of Columbia | 10.6% | North Carolina | 8.0% |
| Kentucky | 10.4% | Utah | 7.9% |
| Texas | 10.3% | Illinois | 7.9% |
| Virginia | 10.3% | Nebraska | 5.2% |
| South Carolina | 10.2% | | |

Appendix G:

CERTIFICATE AWARDS PER 10,000 POPULATION (IPEDS, U.S. CENSUS)

The table below is based on data from the Integrated Postsecondary Education Data System (IPEDS) and state population data from the 2010 U.S. Census. The table shows the number of certificate awards per 10,000 population in each state, ordered from greatest to least.

| State | Certificate Awards per 10,000 Population | State | Certificate Awards per 10,000 Population |
|----------------|---|----------------------|---|
| Louisiana | 67 | Missouri | 22 |
| Kentucky | 50 | New Jersey | 22 |
| Georgia | 50 | Maryland | 21 |
| Arizona | 50 | Delaware | 21 |
| Florida | 45 | Virginia | 21 |
| Arkansas | 41 | Rhode Island | 20 |
| Washington | 40 | Massachusetts | 20 |
| Kansas | 40 | South Carolina | 20 |
| California | 37 | Oregon | 19 |
| Illinois | 37 | Nevada | 19 |
| Wisconsin | 36 | West Virginia | 17 |
| Oklahoma | 36 | North Dakota | 17 |
| Colorado | 35 | Nebraska | 16 |
| Utah | 32 | New York | 16 |
| Texas | 32 | Indiana | 16 |
| Ohio | 31 | Mississippi | 15 |
| Wyoming | 31 | South Dakota | 15 |
| Minnesota | 30 | Alabama | 15 |
| New Mexico | 30 | Idaho | 15 |
| Connecticut | 29 | District of Columbia | 15 |
| Tennessee | 29 | New Hampshire | 14 |
| Michigan | 27 | Maine | 11 |
| Pennsylvania | 25 | Montana | 8 |
| North Carolina | 23 | Vermont | 8 |
| Alaska | 23 | Hawaii | 6 |
| Iowa | 23 | | |

Appendix H:

CERTIFICATES AS A SHARE OF SUB-BACCALAUREATE AWARDS BY STATE, IPEDS

The table below is based on data from the Integrated Postsecondary Education Data System (IPEDS). It shows the share of sub-baccalaureate postsecondary awards that are certificates in each state, ranked from greatest to least.

| State | Certificates as Share of Sub-Baccalaureate Awards | State | Certificates as Share of Sub-Baccalaureate Awards |
|----------------------|---|----------------|---|
| Louisiana | 83.6% | North Carolina | 48.9% |
| Georgia | 75.8% | Michigan | 48.2% |
| District of Columbia | 66.1% | Minnesota | 46.3% |
| Connecticut | 64.8% | Missouri | 45.8% |
| Kentucky | 64.8% | Oregon | 44.7% |
| Tennessee | 63.1% | Utah | 44.3% |
| Arkansas | 62.0% | West Virginia | 43.7% |
| Wisconsin | 61.6% | Virginia | 43.5% |
| Texas | 58.7% | Alabama | 41.3% |
| Alaska | 57.8% | Idaho | 39.8% |
| Oklahoma | 57.5% | Arizona | 39.4% |
| California | 57.2% | New Hampshire | 39.0% |
| Kansas | 57.0% | South Dakota | 38.8% |
| Illinois | 55.3% | Nebraska | 37.8% |
| Ohio | 55.2% | Indiana | 37.5% |
| Colorado | 55.0% | Rhode Island | 37.0% |
| Nevada | 54.7% | Wyoming | 36.8% |
| Washington | 53.6% | Maine | 33.9% |
| Pennsylvania | 53.3% | New York | 33.9% |
| New Mexico | 53.2% | Mississippi | 31.5% |
| Massachusetts | 52.1% | North Dakota | 31.3% |
| Delaware | 51.9% | Montana | 30.7% |
| Florida | 51.4% | Iowa | 30.2% |
| South Carolina | 51.4% | Vermont | 27.7% |
| New Jersey | 49.3% | Hawaii | 19.9% |
| Maryland | 49.1% | | |

Appendix I:

CERTIFICATE AWARDS BY INSTITUTIONAL CONTROL BY STATE, IPEDS

The table below is based on data from the Integrated Postsecondary Education Data System (IPEDS). The table shows the share of certificates awarded at public and for-profit postsecondary institutions in each state. The states are ordered by the share of awards at public institutions from greatest to least. Private non-profit institutions are not included, but award 5 percent of postsecondary certificates nationally.

| State | Share of Certificates Awarded by | Share of Certificates Awarded by |
|----------------|----------------------------------|----------------------------------|
| | Public Institutions | For-Profit Institutions |
| Wisconsin | 84.2% | 14.3% |
| Arkansas | 82.5% | 13.3% |
| Kentucky | 82.3% | 17.0% |
| North Carolina | 81.9% | 15.7% |
| Georgia | 78.7% | 21.2% |
| South Dakota | 78.5% | 17.2% |
| South Carolina | 77.4% | 22.5% |
| Minnesota | 76.3% | 19.4% |
| Louisiana | 73.9% | 25.7% |
| Washington | 72.3% | 26.2% |
| Kansas | 71.3% | 25.6% |
| Iowa | 71.2% | 24.9% |
| Oklahoma | 71.0% | 28.9% |
| Colorado | 68.5% | 30.2% |
| Alabama | 68.4% | 30.9% |
| Utah | 67.7% | 30.3% |
| Mississippi | 64.1% | 35.9% |
| West Virginia | 62.7% | 32.0% |
| Nebraska | 62.5% | 34.4% |
| Illinois | 61.4% | 33.1% |
| North Dakota | 60.1% | 32.0% |
| New Mexico | 59.9% | 40.1% |
| Montana | 59.2% | 34.0% |
| Ohio | 55.9% | 40.2% |
| Vermont | 55.8% | 29.3% |
| Arizona | 54.2% | 45.7% |

| State | Share of Certificates Awarded by Public Institutions | Share of Certificates Awarded by For-Profit Institutions |
|----------------------|---|---|
| Hawaii | 52.2% | 45.5% |
| Tennessee | 52.1% | 47.3% |
| Alaska | 50.6% | 48.3% |
| Wyoming | 48.0% | 52.0% |
| Florida | 47.2% | 51.7% |
| Virginia | 46.6% | 48.2% |
| Indiana | 42.5% | 55.6% |
| Michigan | 39.3% | 55.9% |
| California | 38.4% | 54.5% |
| Oregon | 37.6% | 60.9% |
| Idaho | 37.4% | 62.2% |
| Delaware | 35.5% | 62.8% |
| Maine | 33.4% | 58.6% |
| Texas | 32.8% | 65.2% |
| New Hampshire | 31.7% | 64.3% |
| Maryland | 31.0% | 67.7% |
| Missouri | 26.9% | 66.4% |
| Massachusetts | 26.9% | 67.9% |
| Pennsylvania | 22.1% | 65.5% |
| New York | 19.5% | 65.9% |
| Connecticut | 17.7% | 75.3% |
| Nevada | 12.4% | 86.8% |
| New Jersey | 9.4% | 87.0% |
| Rhode Island | 9.3% | 82.4% |
| District of Columbia | 0% | 55.1% |

Appendix J:

CERTIFICATES WITH ECONOMIC VALUE BY STATES (IPEDS AND SIPP)

The table below shows a list of states ranked by the share of certificates that have significant economic value, i.e., provide workers with a significant earnings premium. The calculations are based on the Integrated Postsecondary Education Data System (IPEDS) and the Survey of Income and Program Participation (SIPP). Because neither dataset contains information on both certificate awards by state and earnings, we combined the dataset to calculate the estimates listed in the table below.

The SIPP dataset contains information on earnings classified into 14 fields, and whether certificate holders work in field. The IPEDS dataset provides information on 170 certificate fields and length of program (short-term, medium-term, or long-term) and has certificate awards by state. We combined the 170 fields in IPEDS to reflect the fields in SIPP. Because the fields did not align perfectly, we added three additional fields: STEM, Other Liberal Arts, and Other Vocational.

To calculate the share of certificate with economic value, we first assumed that the very small share of long-term certificates (less than 5 percent nationally) had economic value. For short- and medium-term certificates, we used SIPP data to develop estimates of the earnings returns for each of the 17 fields adjusted for sex composition. Certificate fields that provided earnings returns greater than 20 percent counted as having economic value.

| State | Share of Certificates with Economic Value | State | Share of Certificates with Economic Value |
|---------------|---|---------------|---|
| North Dakota | 65.2% | Hawaii | 55.7% |
| Montana | 65.1% | Oregon | 55.3% |
| Rhode Island | 65.1% | Indiana | 54.7% |
| South Dakota | 63.9% | Pennsylvania | 54.7% |
| Idaho | 63.5% | Vermont | 54.6% |
| Nebraska | 60.9% | Maine | 54.5% |
| Iowa | 59.7% | New York | 54.4% |
| Wyoming | 59.5% | Tennessee | 53.8% |
| Connecticut | 57.4% | Massachusetts | 53.6% |
| West Virginia | 57.1% | Mississippi | 52.2% |
| New Jersey | 56.7% | Missouri | 51.3% |
| Maryland | 56.3% | New Mexico | 50.3% |
| Oklahoma | 56.3% | Arizona | 49.9% |
| Alaska | 55.7% | Ohio | 49.9% |

| State | Share of Certificates with Economic Value | State | Share of Certificates with Economic Value |
|----------------------|--|----------------|--|
| Virginia | 49.6% | North Carolina | 43.9% |
| Delaware | 49.4% | California | 43.7% |
| Utah | 49.3% | Michigan | 43.3% |
| Arkansas | 49.2% | Georgia | 43.1% |
| Nevada | 49.0% | Washington | 43.0% |
| Minnesota | 49.0% | Kentucky | 42.1% |
| Texas | 47.9% | Illinois | 41.5% |
| District of Columbia | 47.3% | Louisiana | 40.9% |
| Kansas | 47.3% | New Hampshire | 40.9% |
| Alabama | 46.2% | Colorado | 39.3% |
| Wisconsin | 45.0% | South Carolina | 37.5% |
| Florida | 45.0% | | |

REFERENCES

- Bailey, Thomas, Gregory Kienzl, and Dave E. Marcott. 2004. *The Return to a Sub-Baccalaureate Education: The Effects of Schooling, Credentials and Program of Study on Economic Outcomes*. Washington, D.C.: U.S. Department of Education.
- Bloom, Harold S, Larry Orr, Stephen Bell, et al. 1997. "The Benefits and Costs of JTPA Title II-A Programs: Key findings from the National Job Training Partnership Act Study," *Journal of Human Resources* 32(3): 549-576.
- Bosworth, Brian. 2010. *Certificates Count: An Analysis of Sub-baccalaureate Certificates*, Complete College America. http://knowledgecenter.completionbydesign.org/sites/default/files/352_CCA_2010.pdf.
- The Center for Governmental Studies, Northern Illinois University. 2007. *The Economic Impact of Illinois Community Colleges*. <http://www.iccb.org/pdf/reports/EconomicImpact2007.pdf>.
- Colorado Community College System. 2010. *Wage Outcomes for CCCS Students*. <http://www.cccs.edu/Docs/Research/WageOutcomes2010.pdf>.
- Complete College America. 2011. *A Working Model for Student Success: The Tennessee Technology Centers: Preliminary Case Study*. Washington, D.C.
- Deming, David J., Claudia Goldin, and Lawrence F. Katz. 2012. "The For-Profit Postsecondary School Sector: Nimble Critters or Agile Predators?," *Journal of Economic Perspectives*, American Economic Association, 26(1): 139-64.
- Florida, Department of Education. 2011. *The Florida College System: Annual Report*. <http://wwwfldoe.org/cc/pdf/annualreport2011.pdf>.
- Grubb, W. Norton. 1995. "The Returns to Education and Training in the Sub- Baccalaureate Labor Market: Evidence from the Survey of Income and Program Participation 1984-1990," (Berkeley, CA: National Center for Research in Vocational Education Publication).
- Grubb, W. Norton. 1993. "The Varied Economic Returns to Postsecondary Education: New Evidence from the Class of 1972," *Journal of Human Resources*, 28: 365-282.
- Grubb, W. Norton. 2002. "Learning and earning in the middle, part I: national studies of pre-baccalaureate education," *Economics of Education Review* 21(4): 299-321, <http://ideas.repec.org/a/eee/ecoedu/v21y2002i4p299-321.html>.
- Holzer, Harry and Robert Lerman. 2007. *America's Forgotten Middle-Skill Jobs: Education and Training Requirements in the Next Decade and Beyond*. Washington, D.C.: Skill2Compete & The Workforce Alliance.

Jepsen, C., Troske, K., and Coomes, P. 2009. "The labor-market returns for community college degrees, diplomas, and certificates," *University of Kentucky Center for Poverty Research Discussion Paper Series*, DP2009-08. <http://www.ukcpr.org/Publications/DP2009-08.pdf>.

Kane, Thomas J. and Cecilia Elena Rouse. 1995. "Comment on W. Norton Grubb, 'The Varied Economic Returns to Postsecondary Education: New Evidence from the Class of 1972,'" *Journal of Human Resources* 30(1): 205-21.

Kane, Thomas J. and Cecilia Elena Rouse. 1995. "Labor-Market Returns to Two- and Four-Year College," *American Economic Review* 85(3): 600-14.

Kerckhoff, Alan C., and Lorraine Bell. 1998. "Hidden Capital: Vocational Credentials and Attainment in the United States." *Sociology of Education* 71: 152-74.

Lalonde, Robert J. 1995. "The Promise of Public Sector-Sponsored Training Programs." *Journal of Economic Perspectives* 9(2): 149-168.

Robison, M Henry, and Kjell A. Christophersen. 2006. *Economic Contribution of Contra Costa Community College District*. CCBenefits, Inc. http://www.4cd.edu/crpa/district_reports/Volume%201%20-%20Main%20Report.pdf.

Robison, M Henry, and Kjell A. Christophersen. 2008. *Economic Contribution of Connecticut's Community Colleges: State of Connecticut*. Economic Modeling Specialists, Inc. <http://www.commnet.edu/planning/Research/EconomicImpact/BOT.pdf>.

Robison, M Henry, and Kjell A. Christophersen. 2002. *The Socioeconomic Benefits Generated by Joliet Junior College*. CCBenefits, Inc. <http://www.jjc.edu/about/college-info/institutional-research/Documents/finance/2007-econ-impact-long-report.pdf>.

Robison, M Henry, and Kjell A. Christophersen. 2007. *Economic Contribution of Community College of Southern Nevada*. Economic Modeling Specialists, Inc. http://www.csn.edu/PDFFiles/Administration/Planning_and_Development/InstitutionalResearch/HistoricalReports/EconomicImpactStudy-May2007.pdf.

Robison, M Henry, and Kjell A. Christophersen. 2008. *Economic Contribution of Schenectady County Community College*. Economic Modeling Specialists, Inc. http://www.sunysccc.edu/about/impact/1_Main%20Report.pdf.

Robison, M Henry, Kjell A. Christophersen, and Timothy P. Nadreau. 2010. *The Economic Contribution of Ohio's Community Colleges*. Economic Modeling Specialists, Inc. <http://www.ohiocommunitycolleges.org/assets/images/public-pages/cc9b4fe88eb614cf69a0568c16b94b9e.pdf>.

Robison, M Henry and Kjell A. Christophersen.. 2006. *The Economic Contribution of the Community Colleges of Oregon*. CCbenefits, Inc. <http://www.oregon.gov/ccwd/pdf/MainReportFinal.pdf>.

Robison, M Henry, Kjell A. Christophersen, and Timothy P. Nadreau. 2010. *Moving Texas Forward: The Economic Contribution of the Community Colleges of Texas*. Economic Modeling Specialists, Inc. <http://www.tacc.org/documents/MainReport.pdf>.

Robison, M Henry, Kjell A. Christophersen, and Timothy P. Nadreau. 2005. *The Economic Contribution of Washington Community Technical College Districts*. CCbenefits, Inc. http://www.sbctc.ctc.edu/docs/data/econ_contrib_of_wa_ctcs.pdf.

Rosenbaum, James E., and Janet Rosenbaum. 2011. "Shaping College Success and Career Trajectories: Reconceiving College Procedures." Mapping Broad Access Higher Education Conference at Stanford University. 16-19.

Rosenbaum, James E., Jennifer Stephan, Janet Rosenbaum, Amy E. Foran, and Pam Schuetz. 2012. *Beyond BA Binders: Cultural Impediments to College Success. My 4-year degree was the longest 8 years of my life*. Cambridge, MA: Harvard University Press.

Ryan, Camille L. 2005. *What it's Worth: Field of Training and Economic Status in 2001*. Current Population Reports. Washington, D.C.: U.S. Census Bureau.

U.S. Department of Education. 2009. *Changes in Postsecondary Awards Below the Bachelor's Degree: 1997 to 2007*. National Center for Education Statistics Report 2010: 167. Washington, DC: U.S. Department of Education.

Certificates: Gateway To Gainful Employment and College Degrees
comprises a full report and executive summary.
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3300 Whitehaven Street NW, Suite 5000
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